



Towards an integrated Baltic Sea Region: Cities and Regions as drivers for spatial development and integration

Working Group 1

Final Report of the project work coordinated by Nordregio
in the framework of the East-West Window project

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*BSR Interreg IIIB Neighborhood Programme –
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Peter Schmitt has performed the analytical work and the drafting of the report. Johanna Roto drafted all the maps and figures and have collected lots of data for the Nordic Countries and partly even for the entire BSR. Jörg Neubauer has conducted and updated a study on demographic development in BSR cities (cf. chapter 3.1.1).

Nordregio performed the collection of data and statistics with the support of national experts for almost each of the BSR countries. The authors would like to thank especially Marek Dutkowski (University of Szczecin, Poland), Patrycja Jakubowska (Ministry of Regional Development, Poland), Dimitri Semenkevich (Institute for Regional and Urban Planning, Belarus), Wilfried Görmar and Isabelle Manz (Federal Office for Building and Regional Planning, Germany), Julia Spirina, Gennady M. Federov, and Larisa Emelianova (Immanuel Kant University of Kaliningrad), Nina Oding and Leonid Limonov (Leontief Centre, St. Petersburg), Laila Kule (University of Latvia), Aleksandras Gordevicius (Ministry of Environment, Lithuania) as well as Daniel Rahaut (Nordregio). We also want to thank some further experts, which have provided a number of SMESTO showcases (cf. Appendix report, part 2).

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1. Introduction: objective and scope of the study

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 exploit further 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 way in order to become a strong player in the international territorial competition on the one hand and to minimise regional disparities within the BSR on the other.

In such a specific 'spatial' perspective cities, and in particular so-called metropolitan regions, 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 as an essential catalyst for spatial integration processes. These dynamics nevertheless do not produce the same effects elsewhere as from an international comparative perspective metropolitan regions 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 long-lasting prejudices, sometimes even rivalries, and finally a lack of perception over the specific potentials that are to be found around the BSR 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 urban linkages at a larger geographic scale. Hence spatial integration is supported by specialised networks of 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

can be understood as the sum of interrelations among cities in a network, making them the drivers in a dynamic polycentric organisation within e.g. a transnational macro-region such as the BSR.

From an analytical point of view, such interrelations are, however, difficult to detect, given that little data is available, in respect of indicating the state of spatial integration. Notwithstanding this a considerable component of the analytical work of WG 1 in the EWW-project focussed on gaining an overview of the current trends and potentials of the BSR's 'territorial capital' in respect of metropolitan regions and partly even small and medium-sized towns (SMESTOs). Thus attribute data on the BSRs territorial capital helps us to anticipate the potentials in respect of spatial integration accumulated in individual city(-regions). This data does not necessarily however inform us as to the current state of spatial integration in the BSR.

Therefore the objective of this component of the analytical work of WG 1 is to gain an overview of current trends and of the innovative potentials of the BSR's territorial capital in respect of cities and city-regions. As such, the following key questions will be highlighted in this report:

- How far are BSR metropolitan regions able to contribute to enhancing transnational spatial, i.e. institutional and functional integration with other marco-regions in Europe or even beyond?
- How far do cities and regions in general contribute to spatial integration and territorial cohesion within the BSR?
- What kinds of trends are visible in this respect and (with regard to SMESTOs) what policies are to be found in the BSR countries?
- What kinds of conclusions and policy implications can be derived on the base of this bunch of analysis?

In order to address these questions, the urban landscape in the BSR has been divided into metropolitan regions (cf. chapter 2) and small and medium-sized towns (SMESTOs) (cf. chapter 3)

Organisational and methodological aspects of our study

In planning our analytical work, we have, within our working group, extensively discussed the following three methodical questions:

- What is it that is to be analysed and indicated?
- What spatial scales are the most relevant in this respect?
- What indicators can be consulted in view of the availability of harmonised and comparable data in the BSR?

The latter point in particular was the most challenging one for the working group as little corresponding data was available which would allow a thorough understanding of the functional urban geography of both Europe and the BSR. 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 level, or at NUTS 3 level at best) or partly even entire countries instead of cities or city-regions, to say nothing of 'functional' urban areas. Thus within WG 1 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 (cf. chapter 2 and 3.1).

Additionally, the intention has been to include two non-EU countries (specifically the North West Russia area and Belarus) for which, for instance, the European statistical office (Eurostat) does not provide any statistics. In this light we had to use data sets provided by other international institutions such as the OECD (Organisation for Economic Co-operation and Development), the World Bank etc. 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 at least one national expert per country to help with the data gathering. Here in particular the experts from Kaliningrad, St. Petersburg and Minsk were very helpful. 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 (see in particular chapter 2).

¹ ESPON stands for European Spatial Planning Observatory and Network and is sponsored 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 regional planning in joint, trans-national projects.

Additional qualitative studies based on expert knowledge, were conducted to better illuminate the rather quantitative findings in the other chapters. Initially, national information sources were consulted in respect of future demographic developments (cf. chapter 3.1.3). Secondly, national policy approaches have been analysed in order to discern how far they support SMESTOs in becoming well functioning actors in the knowledge economy (cf. chapter 3.2). Thirdly, a number of illustrative case studies of promising SMESTOs in the BSR have been conducted. The intention here was to use a wide array of SMESTOs in the BSR to illustrate how and why they have been able to build-up knowledge-based economic clusters and to become strong competitors in their country, in the BSR or even beyond (cf. Appendix).

2. Metropolitan Regions as transnational/global nodes of the BSR

In the academic literature as well as in corresponding policy documents, metropolitan regions 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'.

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 regions' 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 regions' 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/Danielzyk 2009): (1) Decision and control, (2) innovation and knowledge (3) gateways to markets, people and cultural symbols. These functions are not limited to metropolitan regions alone,

however, when they are combined and concentrated in a certain way, they can cross-fertilize and can thus become characteristic features of metropolitan regions (and specifically of their metropolitan cores).

As a consequence of this, the ambition of WG 1 within the EWW-project has been to analyse whether and to what extent the BSR's metropolitan regions 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 regions 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 regions 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 regions 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 regions.

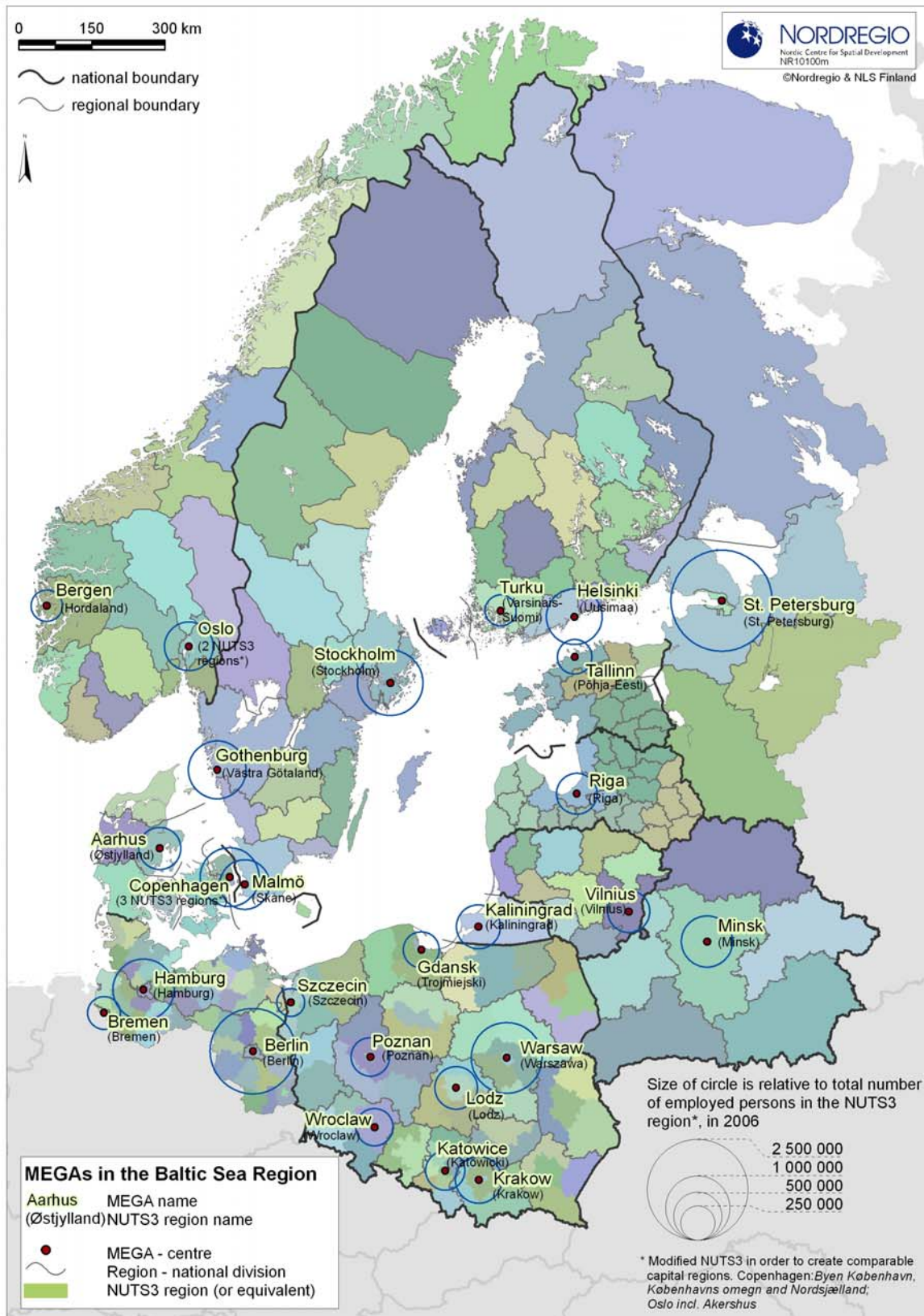
In order to assess its performance as an international gateway to markets, people and cultural symbols, we need to know more about the BSR's metropolitan regions' relative position in the international and intercontinental network of harbours, airports, high-speed railways and motorways. Those infrastructure assets not only ensure the accessibility of metropolitan regions (in both directions) in general, but also guarantee that knowledge, information and markets in such regions are exploitable. Here we can usefully highlight some of the results of WG 2 on accessibility, transport and energy in order to relate their findings to the BSR's metropolitan regions. 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 region 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 regions 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 regions we have used this selection of MEGAs for our study of metropolitan regions in the BSR. Moreover, we have selected Kaliningrad, St. Petersburg and Minsk as further metropolitan regions 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 regions 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 regions 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 regions 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. 1). 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.

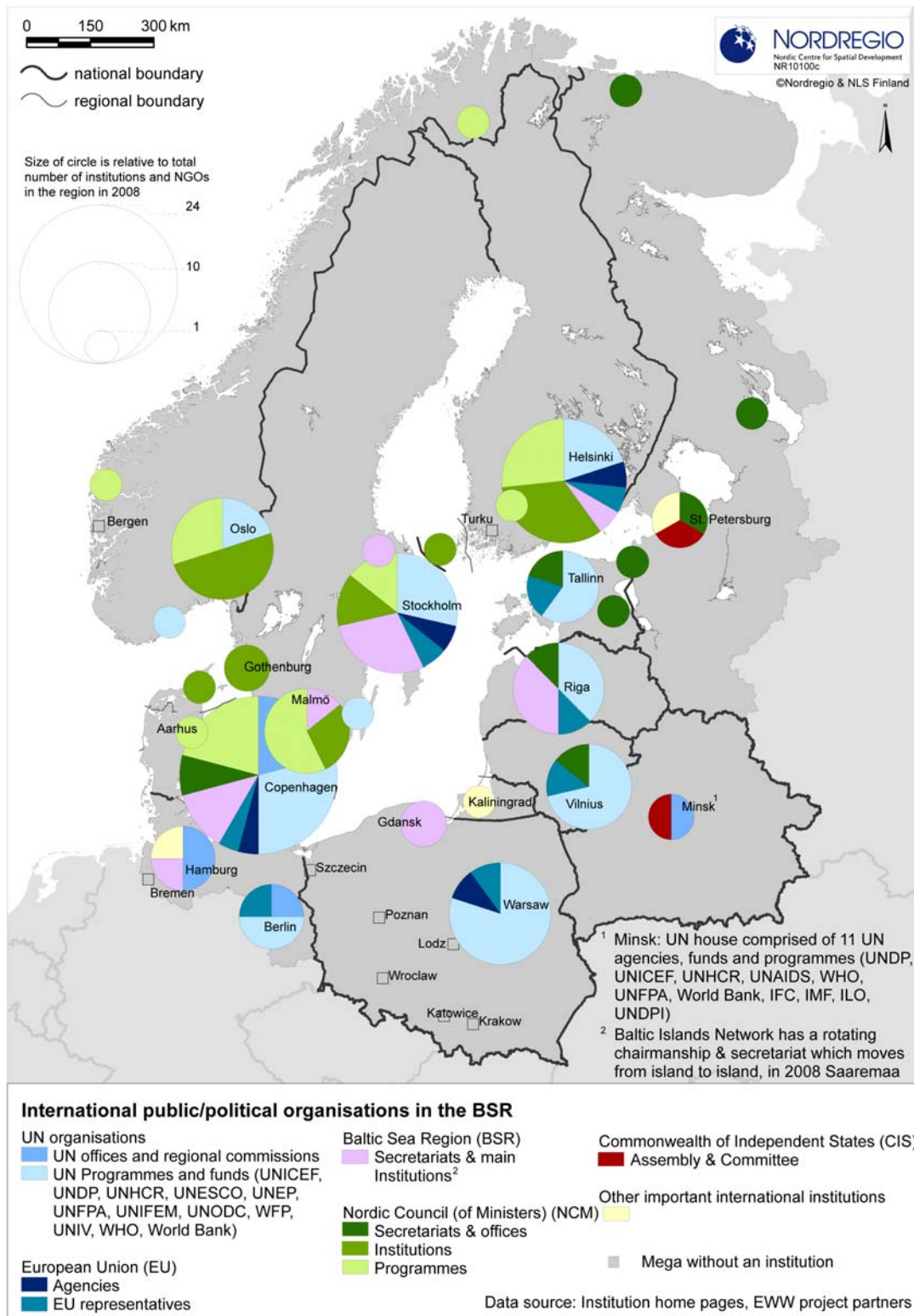
Figure 1: Selected metropolitan regions for the following study



2.1. BSR metropolitan regions as international centres for decision and control

Viewing the BSR's metropolitan regions as nodes for political decision and control one can distinguish different location patterns in relation to the scope and character of the respective institution. 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 regions 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. 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 region 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 2: 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 regions as centres of regulative economic power. Almost all, namely 24 out of the 25 largest companies' headquarters in the BSR, by market value, are located in metropolitan regions (Primarily the Nordic capitals cf. table 1 and 2). 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 1: Largest companies in the BSR by market value in 2008

| Top 25 companies | Industry | Location | Market value in € |
|---|---------------------------------------|---------------|-------------------|
| 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 |
| Rytų 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 2: 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 <i>in numbers</i> | Total sales <i>in bil €</i> |
|---------------------------|--|--------------------------------|
| <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 regions where decision making power is much more concentrated as compared to e.g. Poland or the Baltic States.

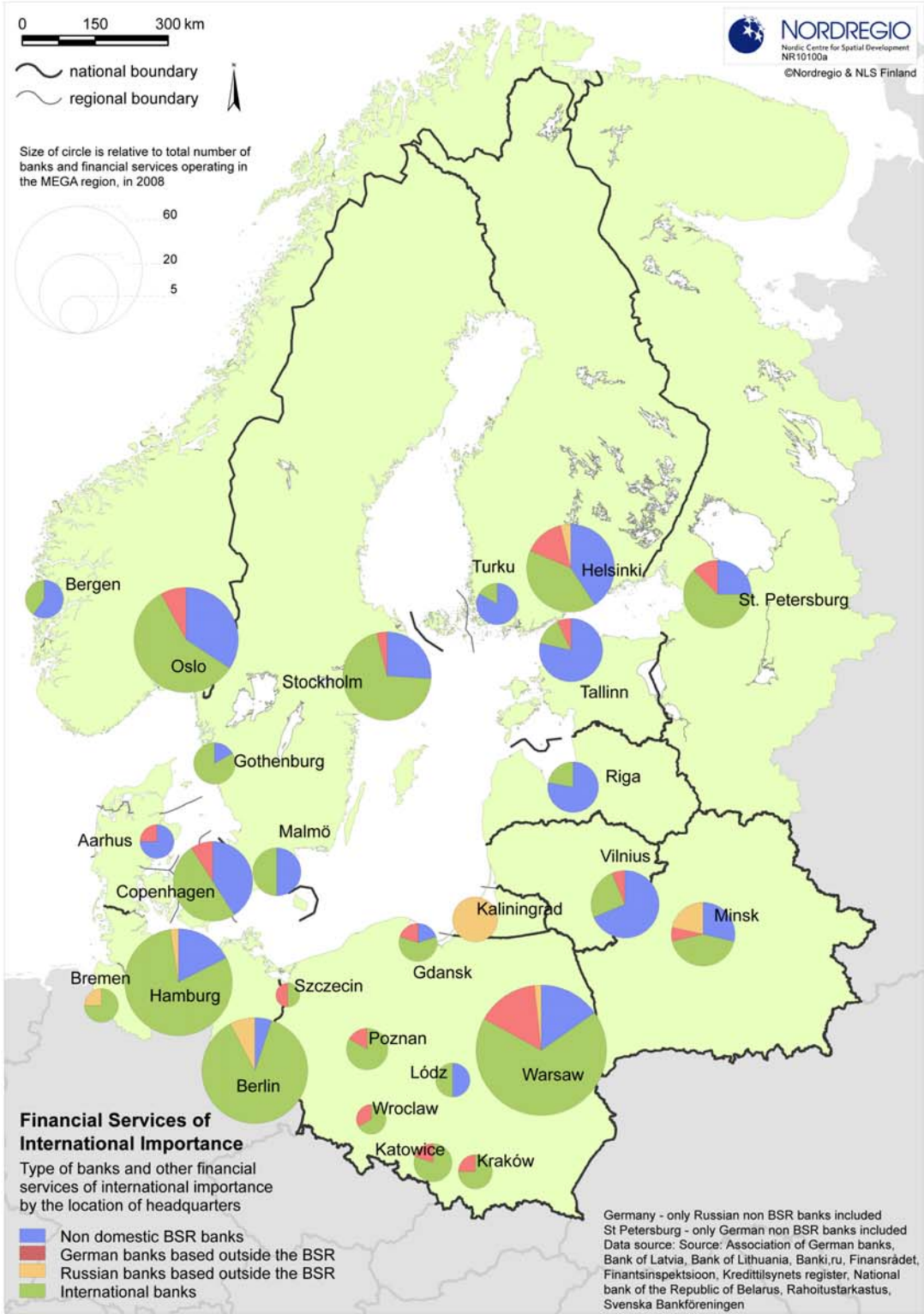
In view of future potentials the existence of international banks and other financial services is critical in terms of better integrating the BSR into the global network economy and even more specifically in this context, in helping to integrate BSR-based firms in other BSR countries as international 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.

The size of the circles is relative to the total number of banks and other financial services operating in the metropolitan region in 2008. With regard to 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 regions 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 region 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, Arhus and Lodz, this 'non-domestic BSR financial services' sector makes up a considerable 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 regions of Stockholm or Helsinki.

To sum up, one can say that the metropolitan regions 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.

Figure 3: Financial services of international importance

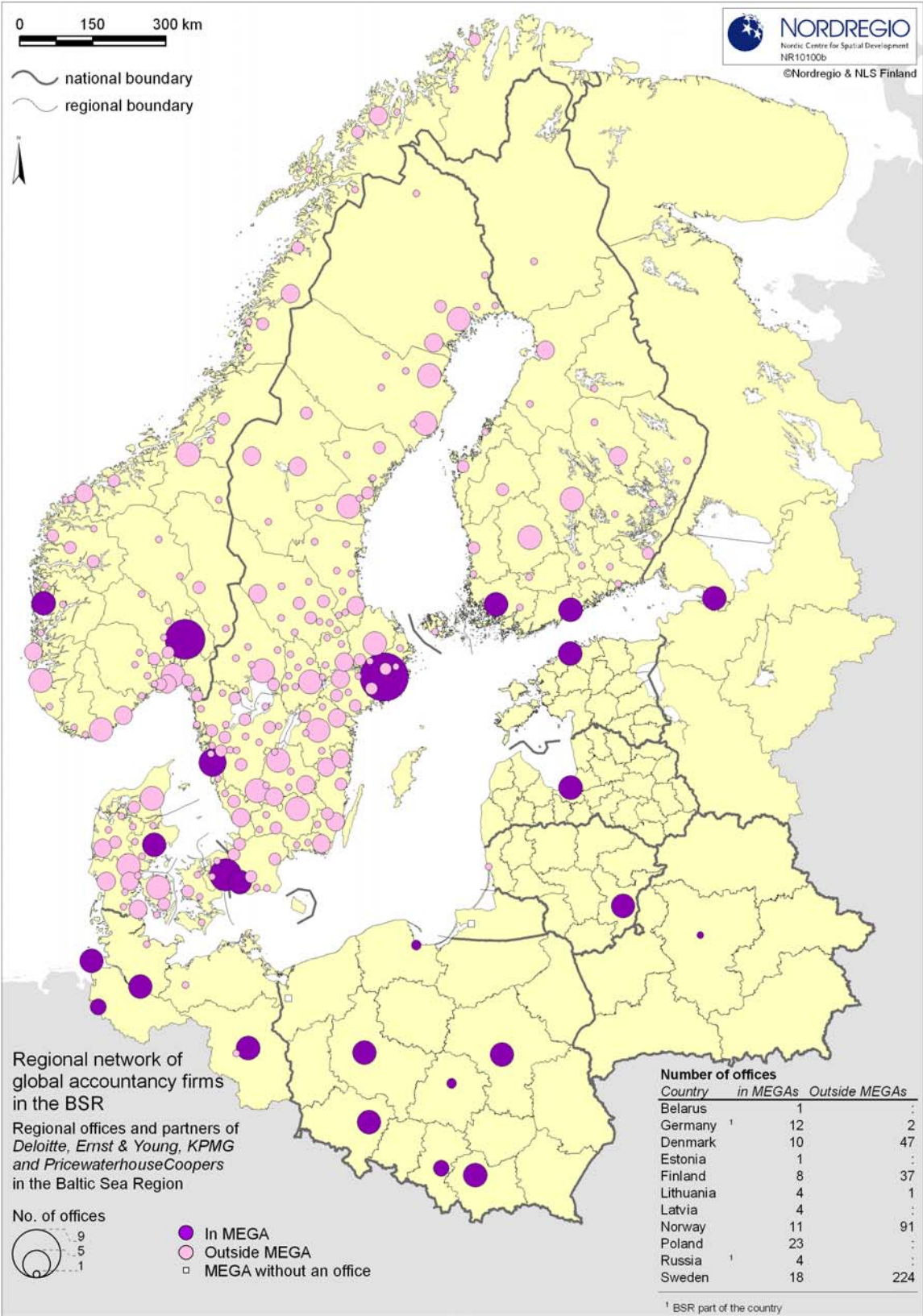


A different view of globalisation is presented in Fig. 4 below in which the regional offices of four highly globalised accountancy firms have been mapped. These firms (*Deloitte, Ernst & Young, KPMG and PricewaterhouseCoopers*) were selected from various lists of top global service firms in light of 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 demanded 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 regions 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 regions 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 regions. 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 4: Regional network of global accountability firms



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 3 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 regions 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 interesting 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. 3.

Table 3: 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)

Looking at the global connectivity of other sectors or fields of activities concentrated in metropolitan regions 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 4). 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 region 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. 2.

Table 4: '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

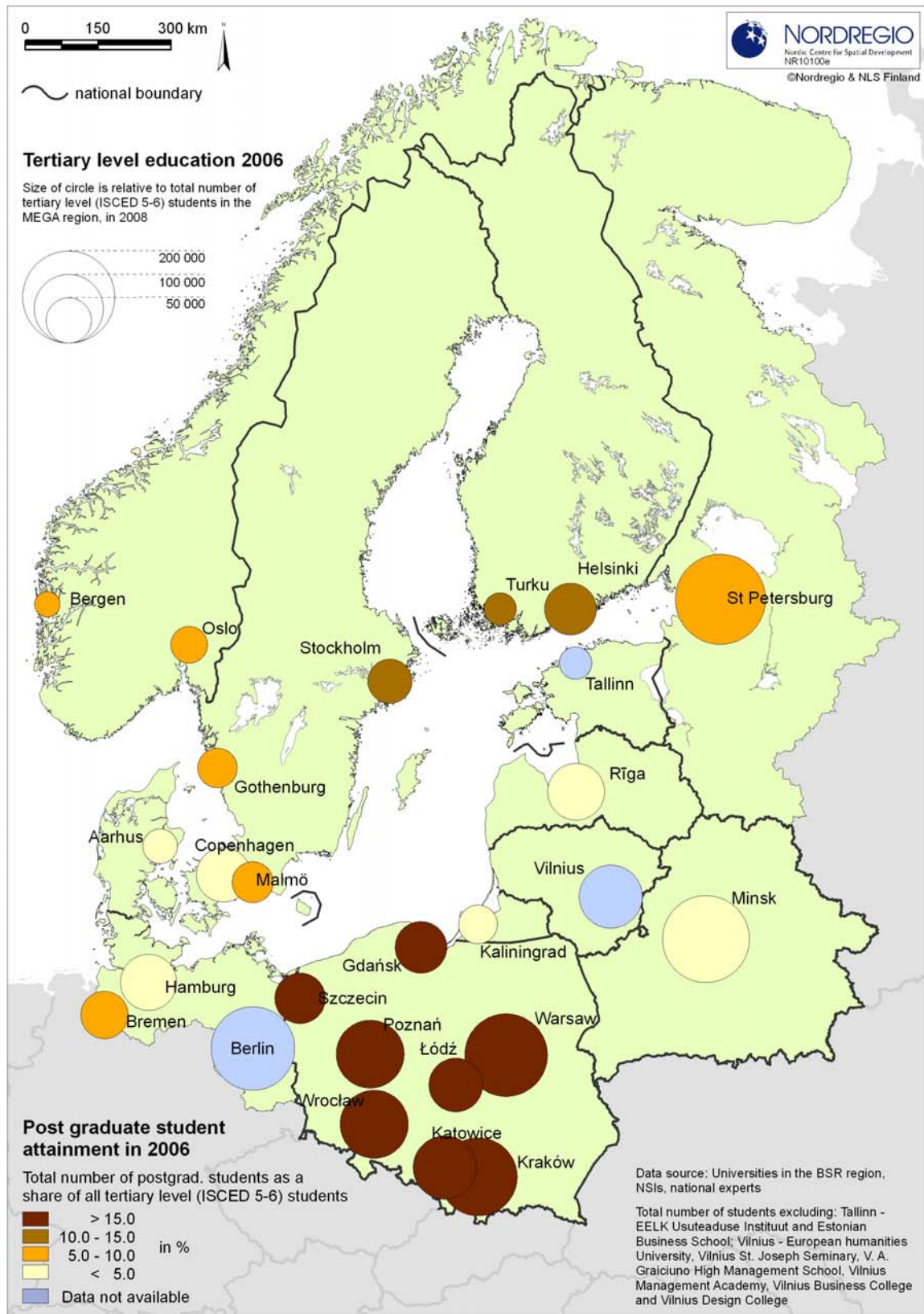
2.2. BSR metropolitan regions as international centres for innovation, research and development

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 regions.

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 6² of the International Standard Classification of Education (ISCED) designed by the UNESCO. What is striking are the high numbers and high share of those students (related to all tertiary levels) in the Polish metropolitan regions. 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 regions 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.

² 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 5: Tertiary level education

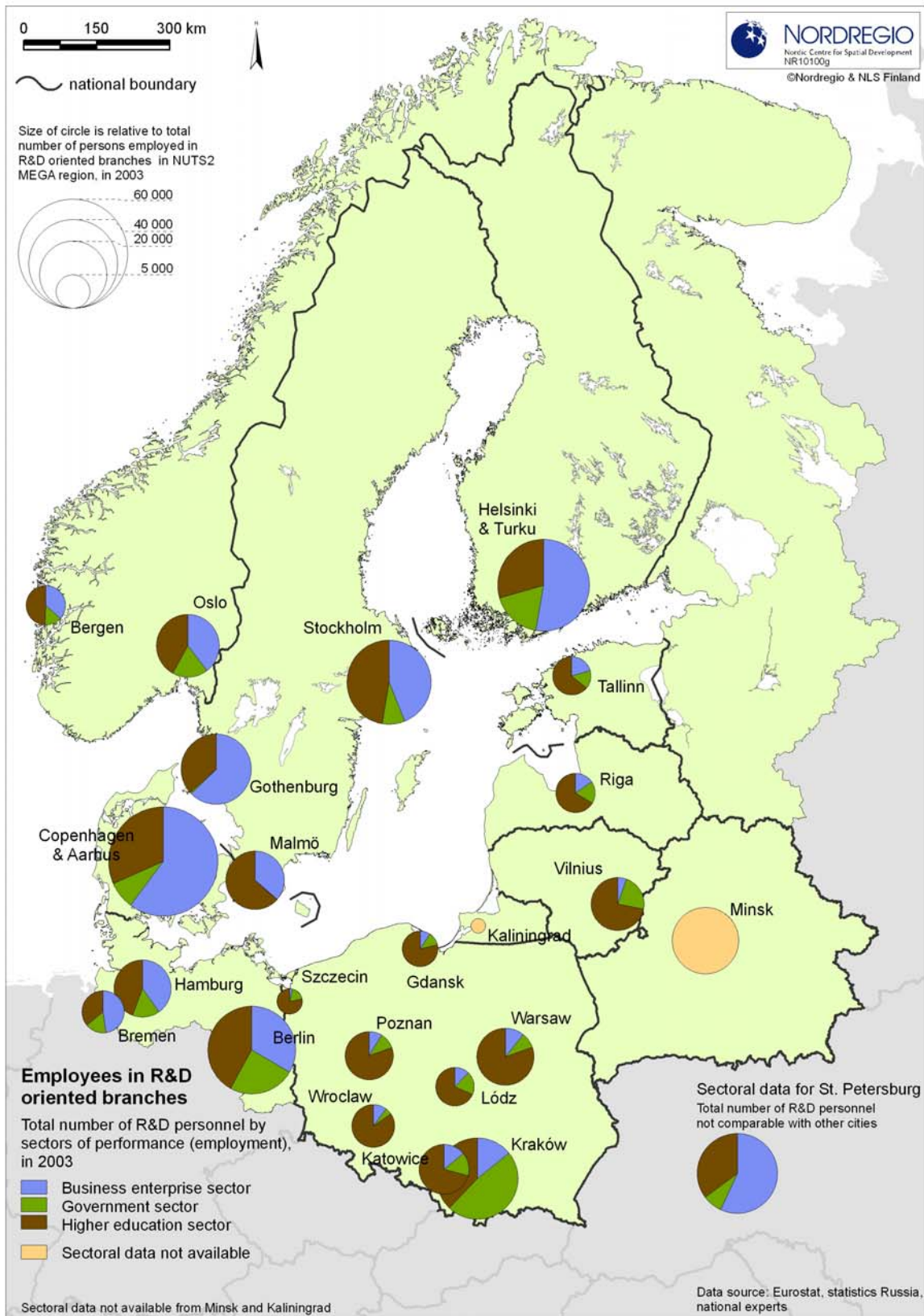


It must be noted however, that relatively high overall numbers or a high share of those postgraduate students can be viewed as a regional competitive asset only insofar as the region manages to hold on to and successfully utilise them, i.e. minimizing the 'brain drain' to other regions after they have completed their studies. In addition, it is also essential in terms of whether a (metropolitan) region 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 regions show a strong share in the higher education sector, but a rather low one in the other two branches (Business and Government sector). It is, in general, interesting that the higher education sector is more strongly represented in the Eastern BSR metropolitan regions 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 regions.

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 regions 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 region 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 regions 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. 6) the profile of Vilnius, and to some extent also those of Katowice and Poznan can also be viewed as rather diversified.

Figure 6: 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 regions 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 region 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. 7).

The following two maps (cf. Fig 8 and 9) provide further insights into the BSR metropolitan regions' 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 regions 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 regions 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 regions. Compared to the other Eastern BSR metropolitan regions 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 7, here: Nanosciences &-technologies, Materials and new Production Technologies). Finally, when interpreting figures 6, 8 and 9, 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 7: Research centres of excellence (public and private)
Research Centres of excellence (public and private)



Areas of competence

- Health
- Information and Communication Technologies
- Energy
- Transport (including Aeronautics)
- Space
- Natural Sciences
- Food, Agriculture and Fisheries, and Biotechnology
- Nanosciences & -technologies, Materials and new Production Technologies
- Environment
- Socio-economic sciences and Humanities
- Security
- Building and Construction



Research Centres with at least 50 researchers in 2008. Research centres in Kaliningrad and Szczecin were not large enough to qualify. Data not available from Tallinn

Figure 8: Employees in technologically-oriented branches

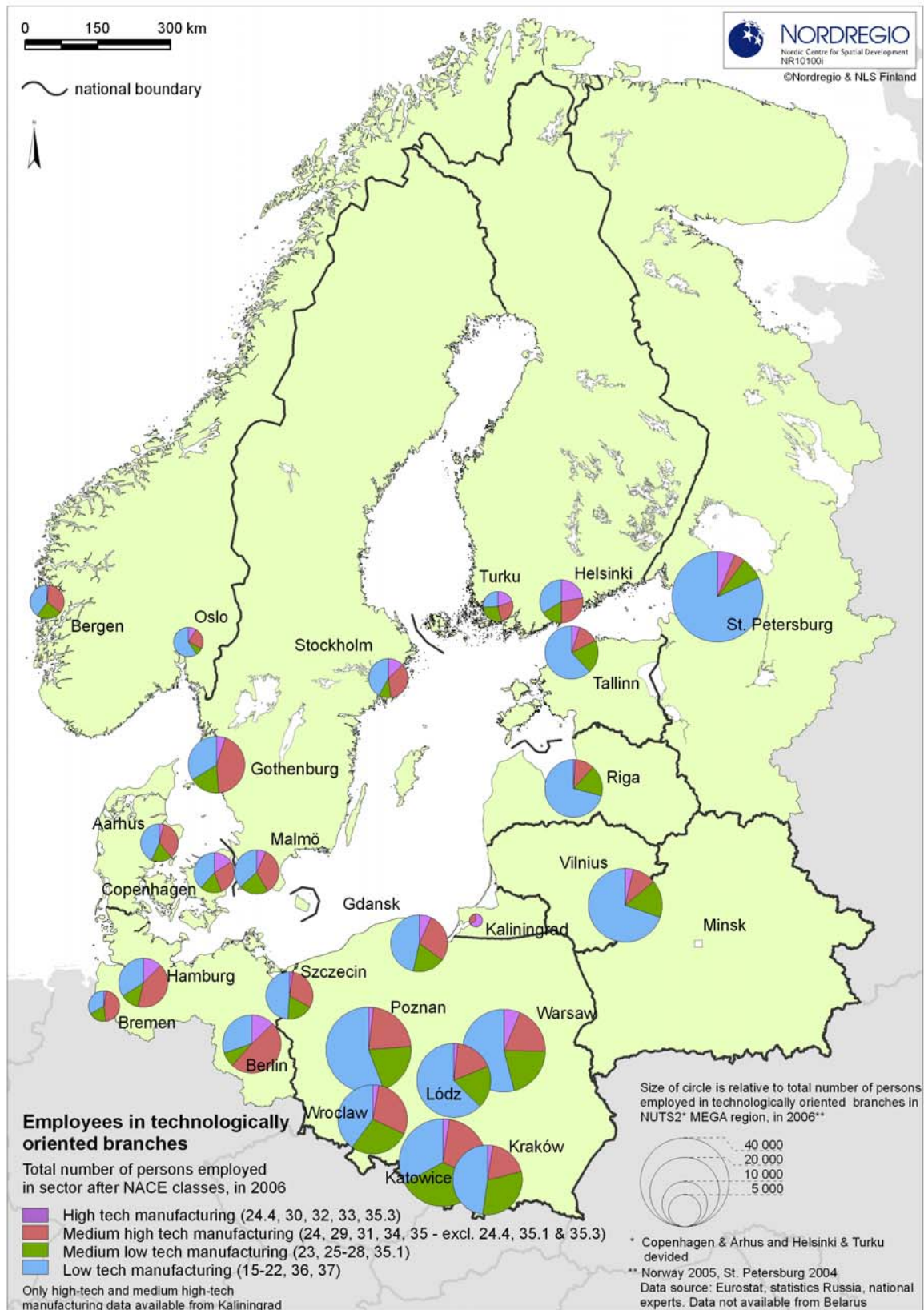
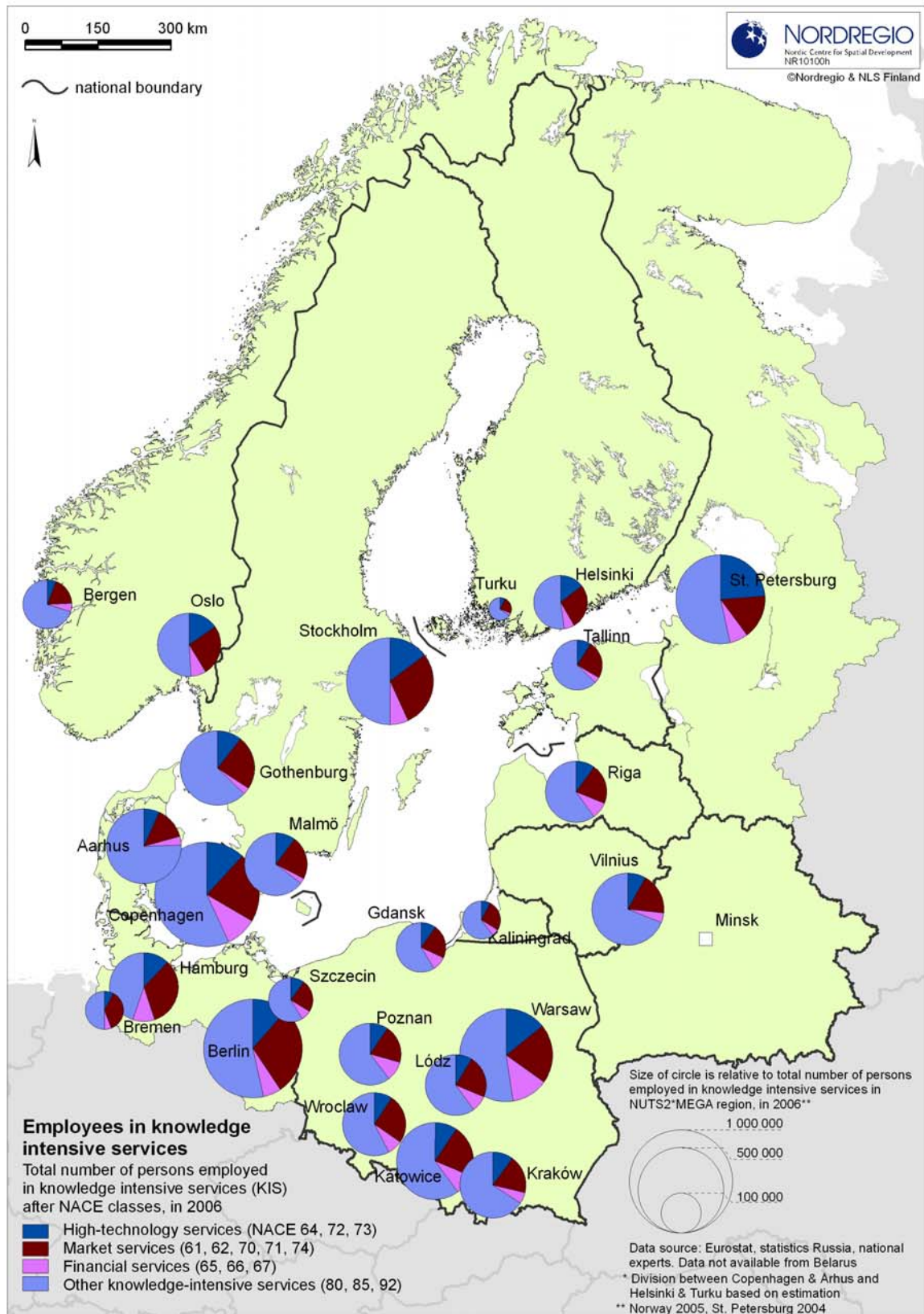


Figure 9: Employees in knowledge intensive services (KIS)



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. 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 inventive performance as applications to national and/or global patent offices are neglected here.³

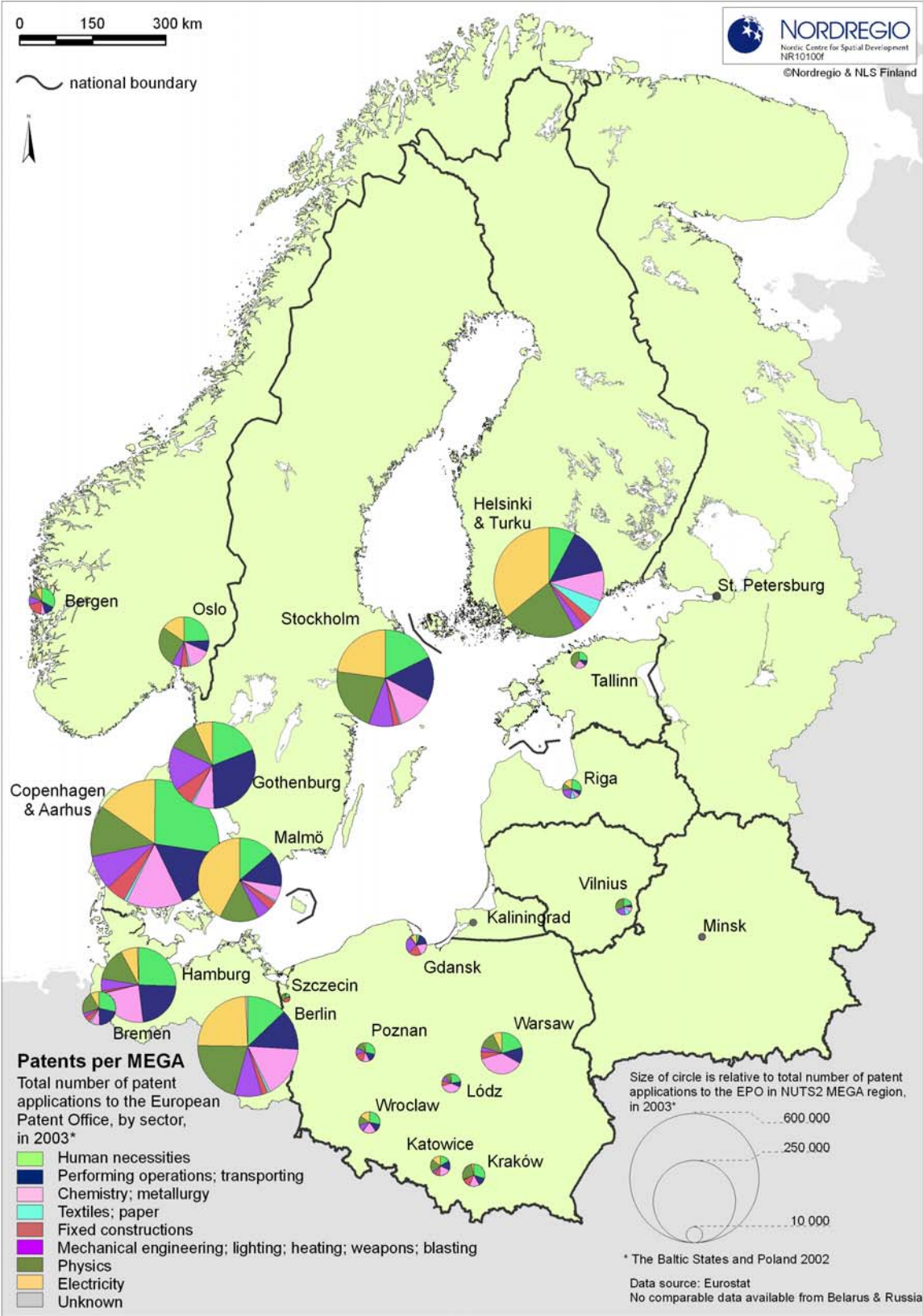
Unfortunately corresponding data is not available for NW Russia and Belarus. Nevertheless what we can learn from this data is that significant differences exist between Western and Eastern metropolitan regions, as most of the western BSR metropolitan regions apply for patents in much higher numbers at 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. 5, 6, 8 and 9). In other words this discrepancy cannot necessarily be traced back to the metropolitan regions' inventive performances⁴, 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

³ 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.

⁴ 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.

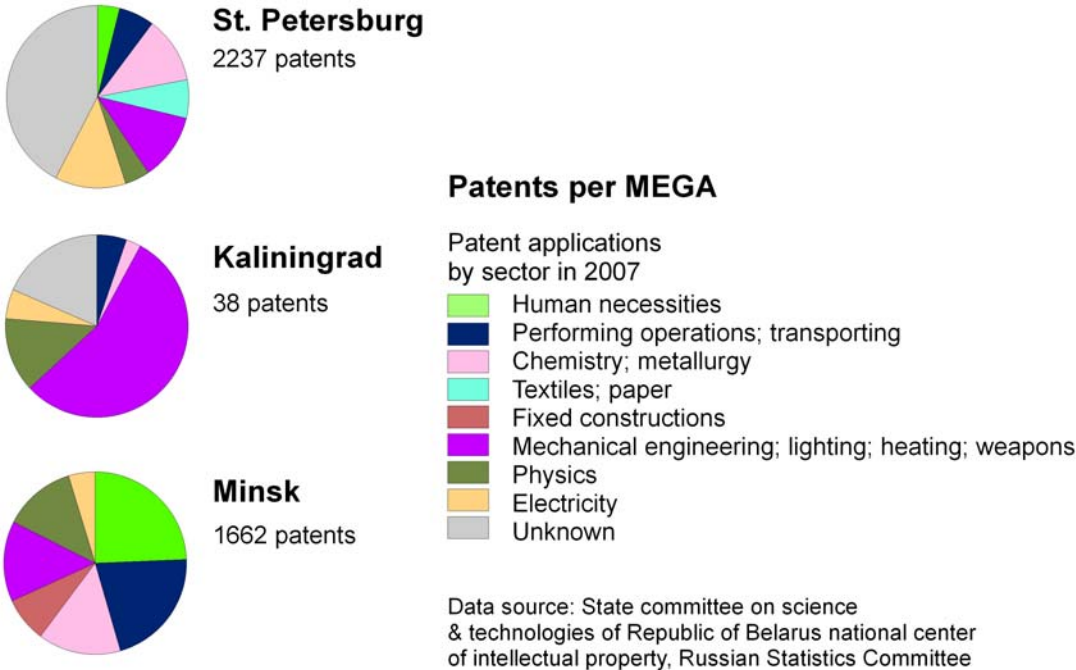
rights will undoubtedly play a crucial role in view of the likely continuing spatial integration within the BSR and beyond.

Figure 10: Patents applications to the European Patent Office (EPO)



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 regions. 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. 10), the total absence of patent applications in the field of 'fixed constructions' in the two Russian metropolitan regions, which can also be observed for the three Baltic metropolitan regions (Talinn, 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 regions 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 institutions and firms.

Figure 11: Sectoral profile of patents applications in Kaliningrad, Minsk and St. Petersburg based on national data



2.3. The BSRs metropolitan regions as collective symbols and as gateways to markets and people

The functioning of the BSR metropolitan regions 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. As mentioned before, in this chapter we have integrated a selection of results provided of 'WG 2 on accessibility, transport and energy', which allows us to get a closer picture of the international gateway function of the BSR metropolitan regions. Nevertheless, in the following we have just picked out some findings from this study regarding air traffic. For further and more detailed information please cf. Dubois et al. (2008).

Initially then we seek to concentrate on the degree of connectivity between the BSR's metropolitan regions and other places in the European and the global economy, both in terms of passenger and goods air transportation. In that context our analysis, based on the number of flights between destinations, is a rather good approximation of the intensity of interactions between BSR metropolitan regions. Consequently, this enables us to identify the most privileged destinations for each region, i.e. the destinations which actors in one region have the most incentive to travel to. These incentives can be based on tourism or business interactions.

From a global perspective it is obvious that none of the BSR metropolitan regions 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 was to 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 un-profitable 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 regions 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 Fig. 12 is the strong relationship exhibited between airports on the Eastern shore of the Baltic Sea (St. Petersburg, Kaliningrad, 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 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. 13). 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.

Figure 12: Air travel connections between BSR metropolitan regions, EU BSR metropolitan regions and neighbouring countries, (spring 2008)

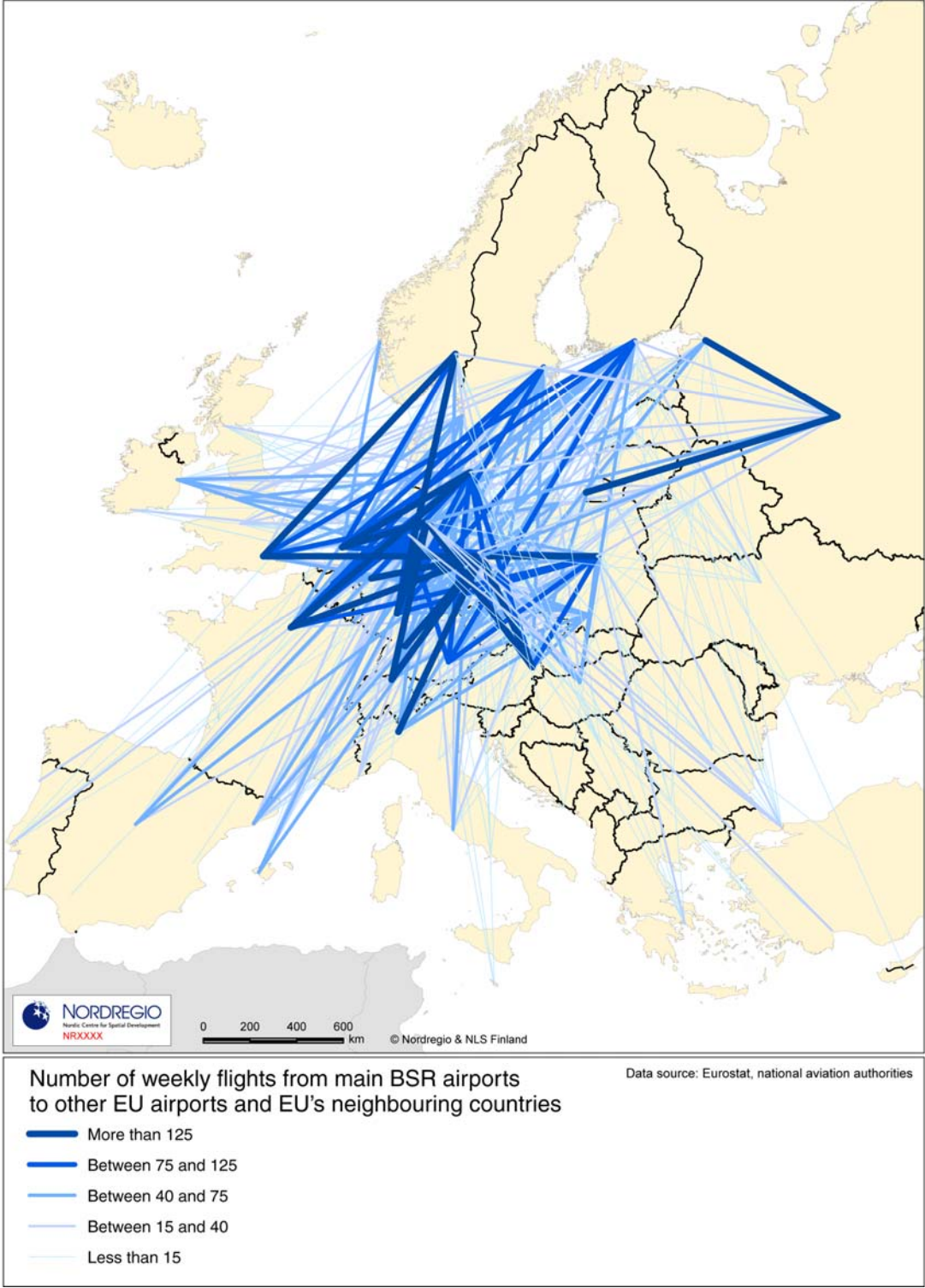
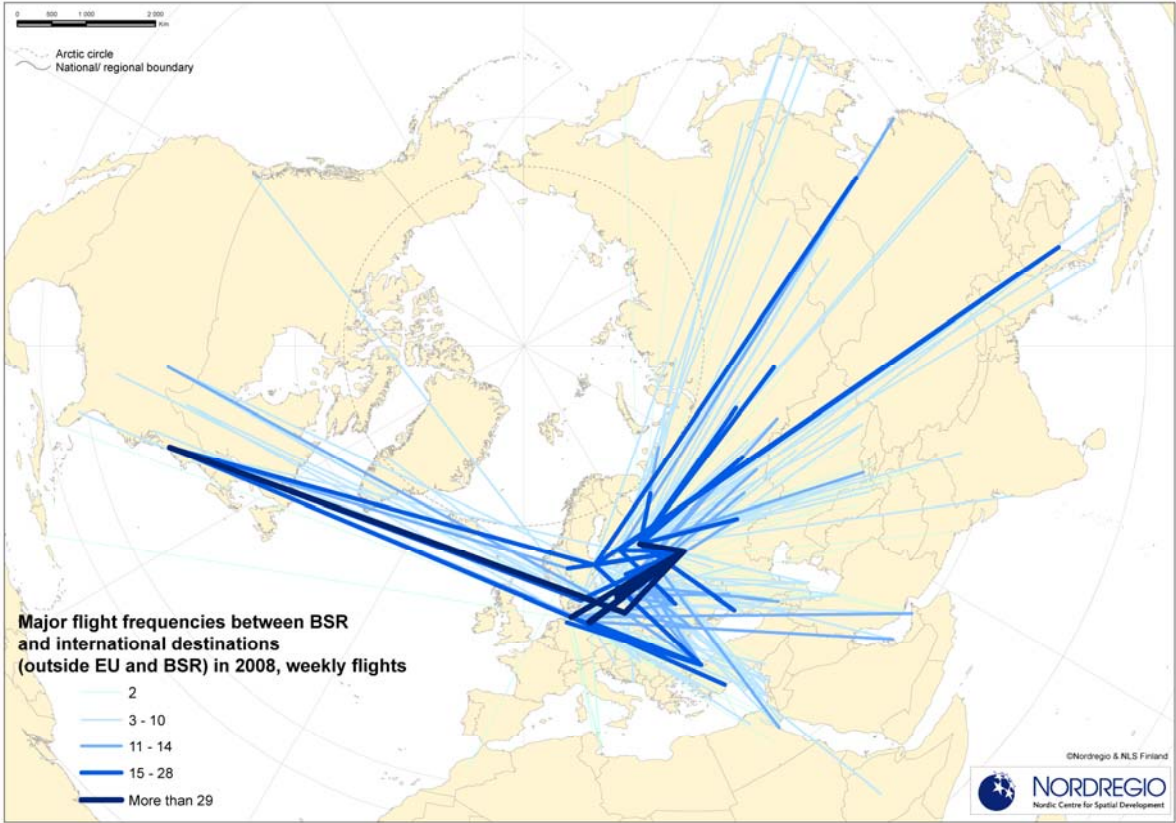


Figure 13: Major flight frequencies between BSR metropolitan regions and international destinations (outside EU and BSR), (spring 2008)

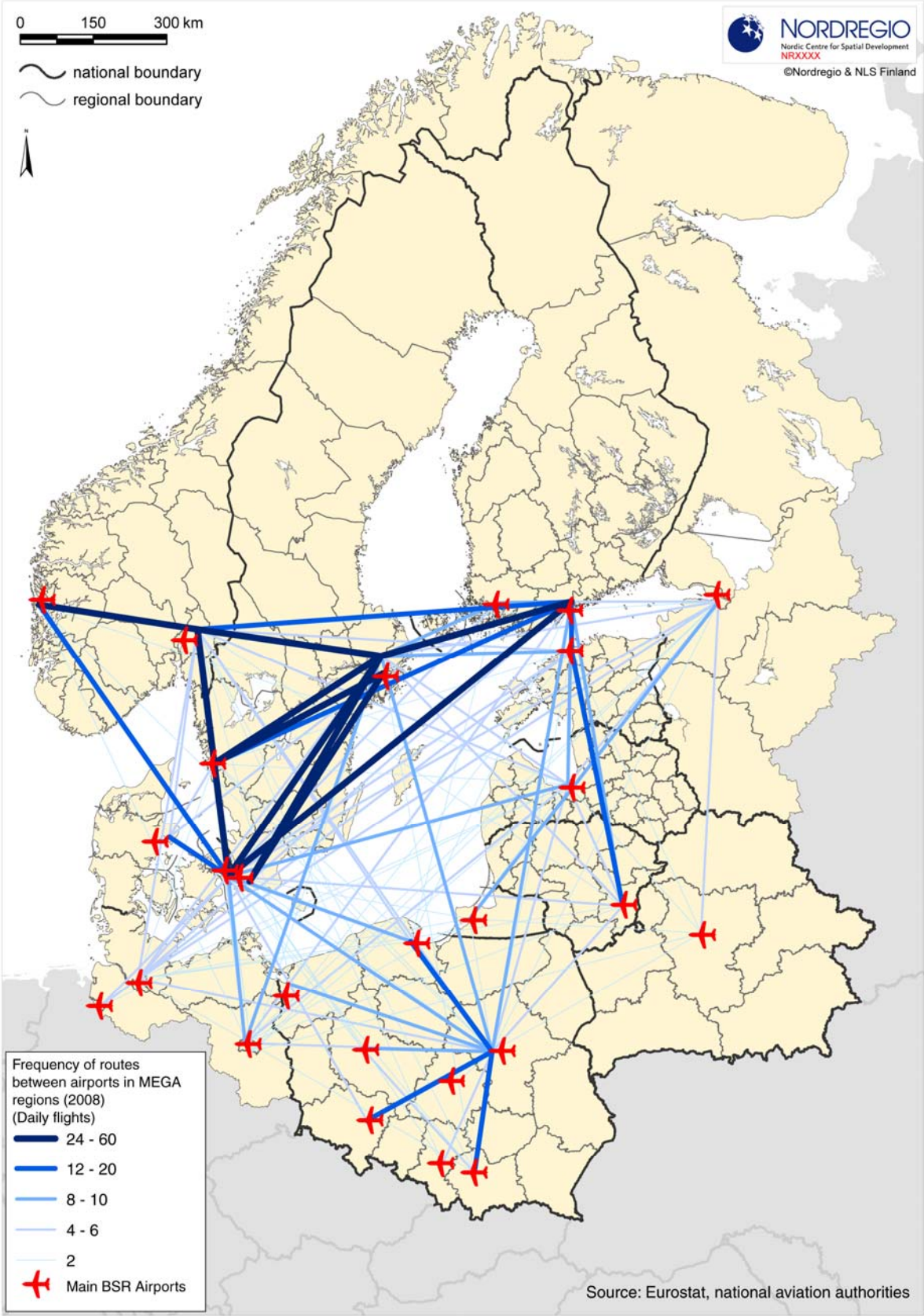


The main global destinations accessible from BSR airports can be separated into three main geographical groupings. First of all, New York is a privileged destination from airports situated in BSR-Germany (Hamburg), Scandinavia (Stockholm, Copenhagen) and Poland (Warsaw). Other destinations on the Eastern 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.

Figure 14 displays the patterns of air travel between the main metropolitan regions in the BSR. At first glance the map shows a dense web of direct flights between these regions, which means that it takes only a relatively short time to travel directly from one BSR metropolitan region to another, as flights are direct and changes are not required. On closer inspection, however, it becomes clear that the smaller metropolitan regions do lack direct connections to some BSR capitals as well as to other secondary metropolitan regions such as almost all the Polish metropolitan regions except for Warsaw, but also for instance to Bremen, Bergen, and Kaliningrad. This means that one-day return trips as favoured by the business world are almost impossible for those located in (or close to) these BSR metropolitan regions.

Figure 14 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 regions situated in the Nordic countries, and not least between the capital regions. This is due to the existence of strong institutional, cultural and historical ties between these countries, but also due to the rather high degree of integration between labour markets and the 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 regions, such as Gothenburg, Malmö, Bergen, Århus and Turku, are also tightly connected to this Nordic web. However, in these cases, such connections are essentially directed towards their own capital region rather than directly to other Nordic destinations. The routes between Oslo-Bergen, Stockholm-Gothenburg and Stockholm-Malmö are thus very frequent, with more than 20 daily connections (for further reading please cf. Dubois et al. 2008).

Figure 14: Air travel connections between BSR metropolitan regions, (spring 2008)



Looking more closely at airports in the BSR's metropolitan regions the figures 15 and 16 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 regions 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 witnessed 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 regions in this respect.

Figure 15: Main international passenger airports in the BSR (2006)

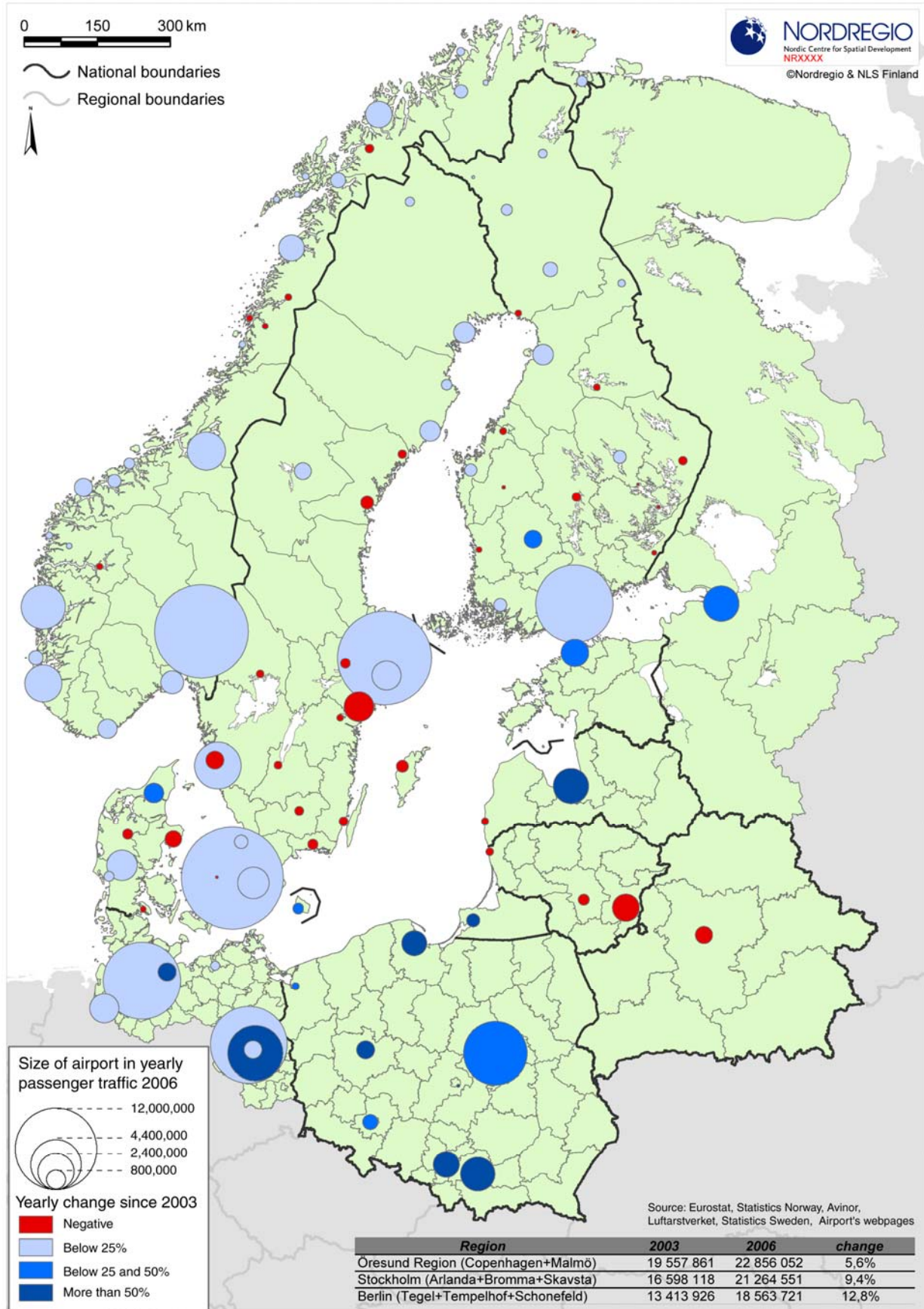
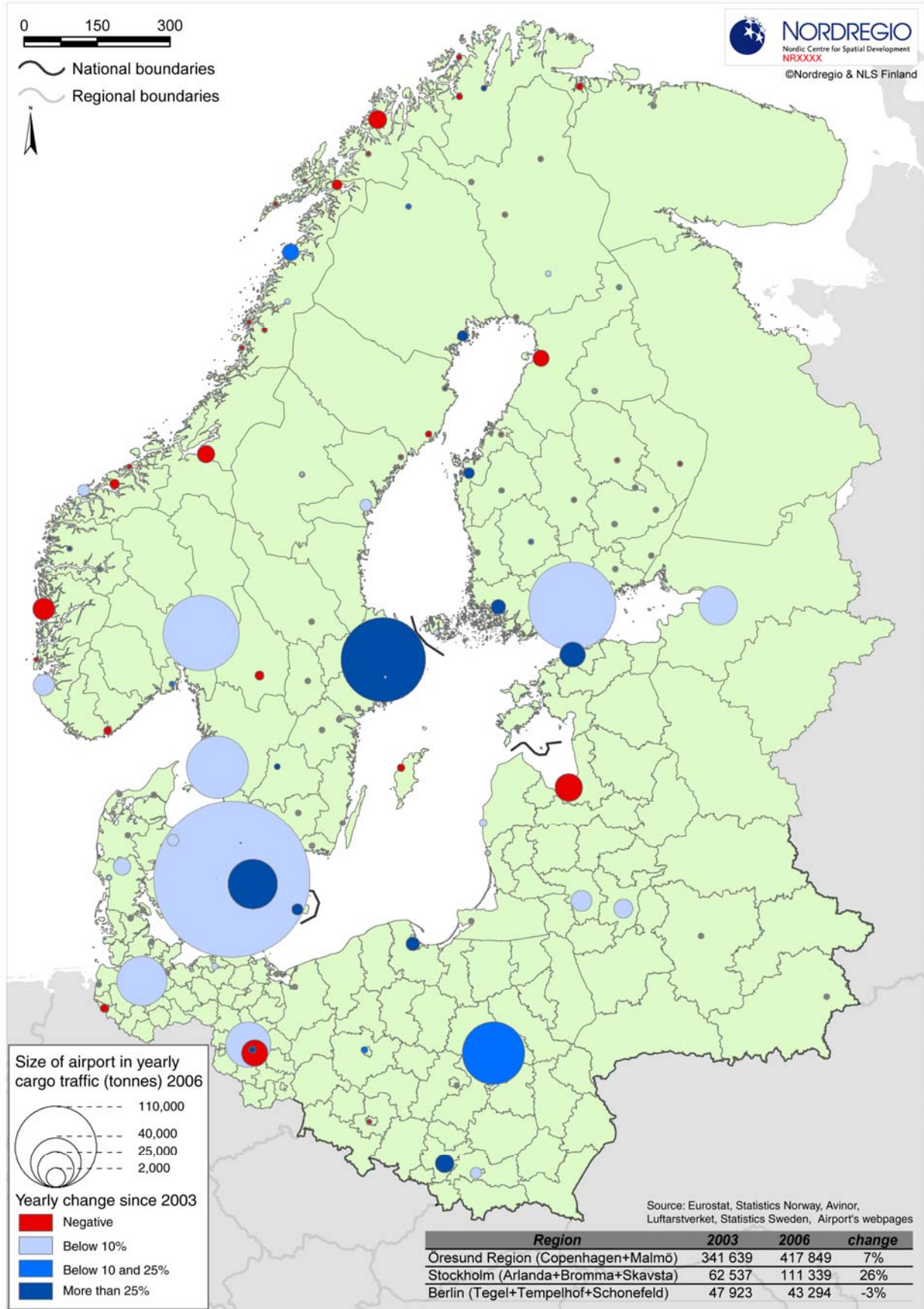


Figure 16: Main international cargo airports in the BSR (2006)



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 regions here play an important role in this respect (cf. Fig. 17). 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 regions 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 regions. 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 regions 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. Not all are however located in or close to our selected metropolitan regions, 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 regions, 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 regions 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.) (cf. Fig. 18). In the appendix of this report an up to date list of the UNESCO world heritage sites located in the BSR is attached.

Figure 17: International fairs in the BSR

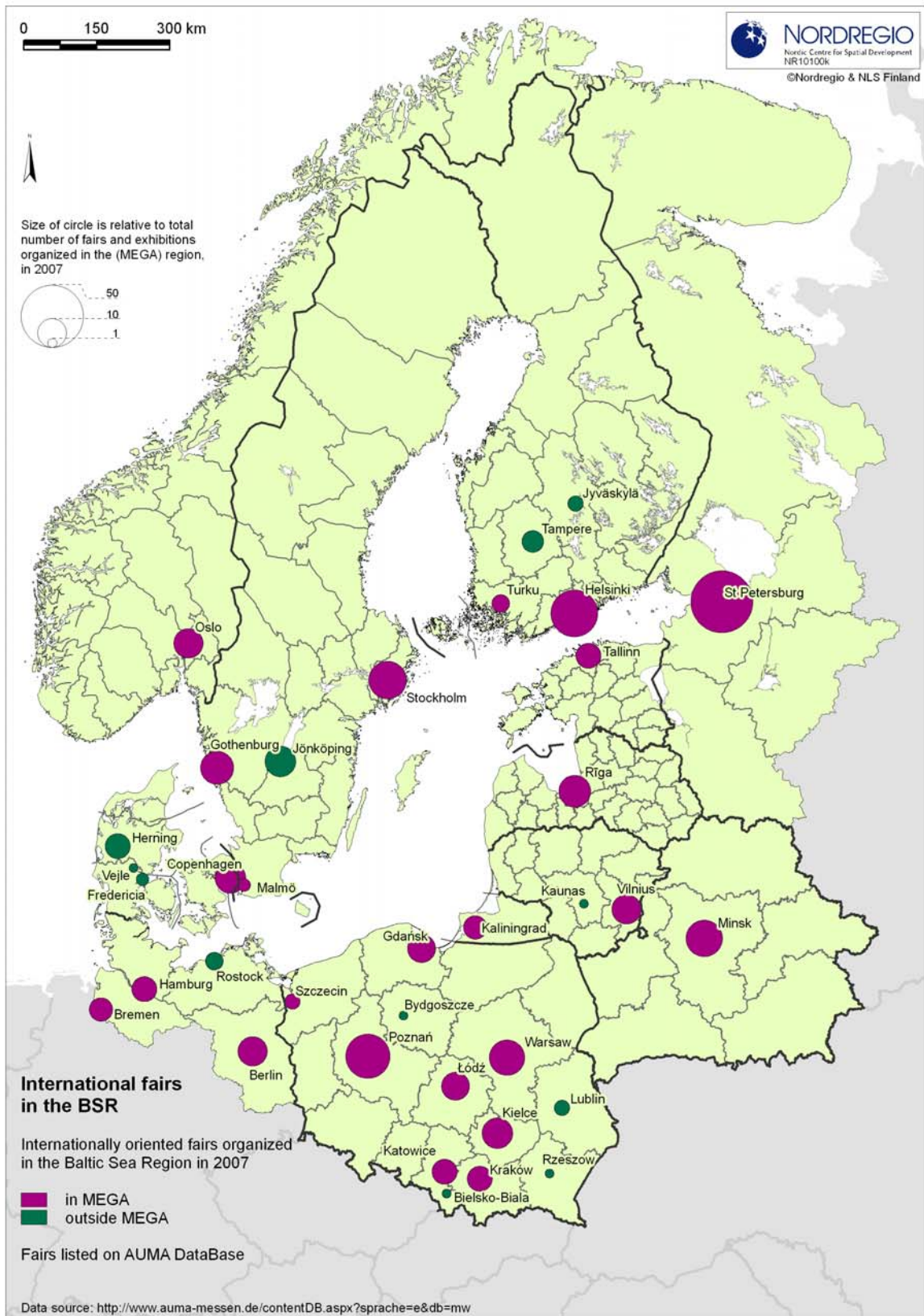
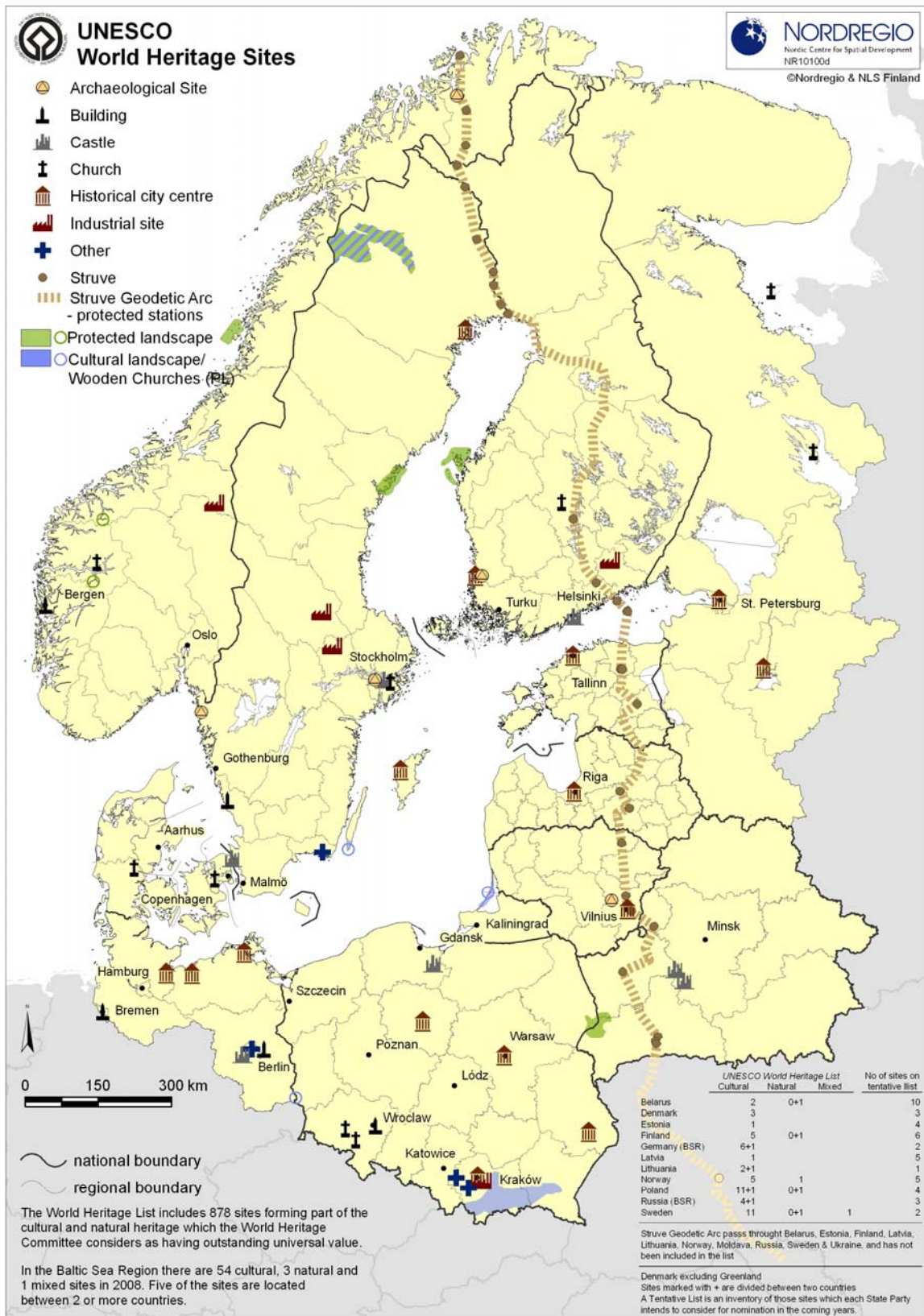


Figure 18: UNESCO World Heritage Sites



2.4. Concluding discussion: challenges and policy issues

In what follows some general challenges are derived based on our analysis of metropolitan functions in the BSR. At this point it is important to stress that in the preceding sub-chapters we have avoided drawing conclusions on each individual indicator or analytical map as we are of the opinion that one can only draw useful conclusions after full consideration of all of the data available.

From a general point of view our study has revealed that the metropolitan regions 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 regions 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 communicated and exploited in the most efficient way possible.

BSR Metropolitan regions as international centres for decision and control

Sharp contrasts can be detected in respect of this specific function among the BSR's metropolitan regions. From a general point of view one can observe a significant difference between the 'Western' and the 'Eastern' BSR metropolitan regions. In the field of international financial services it is clear however that a strong network interconnecting the Eastern metropolitan regions beyond the BSR has not yet been developed, potentially impeding inward investment.

Our study has indicated 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 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 specifically in Kaliningrad, but also in Minsk and St. Petersburg. 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 drivers for spatial integration 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 will be a long term and complex process which goes far beyond the area of responsibility of spatial policy.

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 the international financial capital flow needs 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 of institutional, social and cultural proximity.

The metropolitan regions 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 regions (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 regions 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 and skilled labours etc.). These are likely to be indispensable pillars of a BSR internationalisation strategy.

BSR metropolitan regions as centres for innovation, research and development

Concerning the analysed indicators we can conclude that the East-West divide is somewhat narrower in respect of the decision and control function. Here numerous competences and significant potentials exist given the high critical 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 performance (in terms of the 'ambition' to secure intellectual property rights for European markets!) of the Eastern BSR metropolitan regions 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 region 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 other

Pan-Baltic co-operation as well as mutual learning processes have to be strengthened while new policy concepts are needed to make the BSR's metropolitan regions and their R&D facilities more attractive in 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 is however perhaps of a rather more communicative nature: These potentials need to be promoted and while at the same time the minimisation of institutional and legal barrier should be pursued. These organisations could claim for instance that specific research programmes (including the exchange of researchers) should be initiated for 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.

BSR metropolitan regions, have not yet fully exploited their critical mass here.

BSR metropolitan regions as gateways to markets, people and collective images

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, 'international 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 regions to function as 'gateways' significant contrasts remain apparent. Numerous bottlenecks remain hampering the smooth flow of people and goods within the BSR and beyond (cf. here specifically the final report of WG 2 by Dubois *et al.* 2008). 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 suchn 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 rather '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 regions).

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 has, however, to 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 the international profile of the BSR in general and of its metropolitan regions in particular. Naturally 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 regions 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 regions in terms of the ongoing international competition for 'creative people', investment, first-class infrastructure programmes and events.

In terms of further spatial integration, however, not only does the issue of geographic proximity have to be improved (e.g. via better air links, roads, rail etc., namely, through infrastructural incentives), but rather more importantly perhaps, institutional, organisational and mental proximity related questions must also be addressed. As the examples in this chapter have indicated the need remains for reliable and confiding transactions necessitates the creation of corresponding institutionalised frameworks. Indeed, the creation of these frameworks is more important than the need to overcome 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 they need to establish 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 is rather of integrative and coordinative nature, their tool box is rather limited to implement any concrete incentives. Therefore they also need to establish strategic alliances with those policy-makers dealing with sectoral issues (e.g. higher education, research, transport etc.). Only with their support and financial instruments such strategic integrative concepts as the envisaged Long-Term Perspective can be implemented in the one or other way.

3. SMESTOs as the backbone for territorial cohesion in the BSR?

In the following chapter, the key objective is to get an overview on current trends and innovative potentials of the territorial capital in the BSR by focussing specifically on small and medium-sized towns (SMESTOs). We argue that apart from the idea to develop a strong network of metropolitan regions in the BSR, particularly so-called SMESTOs can play an important role in terms of achieving a better degree of territorial cohesion and functional integration in the BSR. Therefore, we partly relate our findings to the BSR metropolitan regions that have been discussed before (cf. chapter 2).

At first, we analyse some general demographic and economic developments (cf. chapter 3.1). After that, we try to get a deeper understanding of the BSR cities' territorial capital, by highlighting some national policy approaches, which aim at activating the knowledge-based development potentials in the respective cities and towns (cf. chapter 3.2).

A number of showcase studies in the different BSR countries shall demonstrate some specific approaches closer and shall help to comprehend some specific development paths. These showcases are rather of illustrative character. Due to the broad and wide scope of their different natures and those points that have been highlighted by our national experts, they have neither been edited, nor commented. Also their focus are for the most part extremely different, which shows on the one hand the great variety of different approaches across the BSR, on the other hand it makes it very difficult to structure them in a certain way or even to draw any comparisons or even universalised conclusion. Thus, the intention is to demonstrate a large array of different SMESTOs in the BSR in order to illustrate how and why these cities have been able to build-up knowledge-based economic clusters to become strong competitors in their country, in the BSR or even beyond. The complete original texts provided by the national experts are attached as an extra appendix to this report (cf. Appendix part 2: showcases).

3.1. Socio-economic developments

In this chapter, we are exploring some basic socio-economic indicators, which shall inform us about the overall performance of the BSR's cities and regions. The idea is to get an overview on the current state of territorial cohesion vs. regional disparities around the Baltic Sea. In other words, we focus on the complex pattern of growing and shrinking cities and regions with regard to their demographic and economic trends. At first, we have a look at population changes due to natural developments and migration patterns with regard to BSR cities down to 10,000 inhabitants as well as to those settlements of at least 5,000 people, the so-called rural population, which live outside cities with at least 10,000 inhabitants (cf. chapter or figure 19-21 respectively). In order to qualify further these spatial trends, after that, we will consult some basic macro economic indicators such as the regional GDP per capita or recent changes on the labour markets (cf. chapter 3.1.2). Due to the weak availability of harmonised comparable data at the municipal level, we had to use partly data at NUTS 3 level. In order to get an impression on future trends regarding the general evolution of population and its likely socio-economic and territorial impacts, we have gathered some basic national findings on future demographic trends, which have been provided by the national experts (cf. chapter 3.1.3).

3.1.1. Recent demographic trends

Having a first look at some current trends in the demographic development of the Baltic Sea Region's cities one can easily detect a slight overall decline. This decline is driven by substantial natural losses, which are for the most part outweighing the migration gains. Generally speaking, we can recognise that the East-West divide as analysed in the study by Hanell/Neubauer (2005) has been even widened in the time period 2002-2006 due to enduring uneven growth (and decline) in population. Also at a first glimpse, we can observe that almost all areas that are marked by 'rural population' have lost population, whereas the winners are rather to be found in most of the larger cities, although with contrasting tendencies between the countries. More specifically, we can 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 regions we have analysed in chapter 2. Additionally, numerous SMESTOs at the fringe of those metropolitan regions and some other urban agglomerations expand their population most rapidly of all cities due to strong in-migration. In other terms, 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).

As regards the *Nordic countries*, one can say that as a rule the smaller municipalities ($\leq 20,000$ inhabitants) are shrinking, whereas mid-sized cities between 20,000 and 50,000 are rather stable. The winners are in particular to be found in the larger municipalities, i.e. those with 100,000 inhabitants or more. The picture of natural population change and the net migration is for the most part the same. Only in many mid-sized Swedish cities the strong positive net migration do prevail the negative natural population development there. In Denmark, the situation is a bit different, as the most dynamic places are not necessarily the larger cities, rather the mid-sized ones as long as they are surrounding a larger one, such as e.g. Copenhagen or Aarhus. Those classical examples of sub-urbanisation are to be found as well at the edges of the metropolitan regions of Oslo, Stockholm and Helsinki, whereas, in contrast to Copenhagen, also these capital cities are growing annually more than 0.5%.

In the *German part of the BSR* we can observe two different patterns. A rather balanced one in those *Länder* (Federal States) belonging to the former 'Western' part of Germany (Hamburg, Bremen and Schleswig-Holstein) with numerous in- but also de-creasing cities of all sizes. In the eastern part of the German area that belongs to the BSR, the picture is rather diverse. In the proximate hinterland around the city of Berlin, we can find numerous growing cities, whereas Berlin as well as Rostock and Stralsund, both located at the Baltic Sea coast, can be considered as rather stable. All other cities with more than 10,000 inhabitants as well as the so-called rural population are shrinking, most of them even more than 0.5% per year. However, these trends are generated by two overall drivers: a negative natural population development in the whole German area belonging to the BSR (the only exceptions 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 outweigh the negative natural population change, specifically in the larger rural areas of Schleswig-Holstein. Due to the, high rates of out-migrations (partly more than 0.5%) it has speeded up enormously the overall loss of population in the larger parts of Mecklenburg-Vorpommern and partly Brandenburg.

A even more diversified pattern of shrinking, but also growing cities can be found in *Poland*. Here it is almost impossible to draw any more generalised picture. Rather it seems that almost each region (Województwa) does show a different pattern. In many of those regions, specifically cities with less than 20,000 inhabitants have grown (and here specifically those that are classified as 'rural population'), whereas the larger ones

have shrunk in the period between 2002 and 2006. What is striking in the Polish case is that in many rural and urban regions we can recognise a positive natural population development, which is of that extent rather unique in the BSR. Thus, the overall negative national trend can be traced back for the most part 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 time-span 2002-2006, so that the pattern there resembles very much that of Berlin with its proximate hinterland.

With regard to *Belarus* the following three maps illustrate a somewhat distinct national picture too. Besides in particular Minsk, some, but not all other bigger cities with more than 100,000 do show a positive or at least stable annual performance in terms of overall population development due to a rather stable natural population change and a comparatively positive net migration. The rest of the other cities, particularly the smaller ones, are shrinking, most of them very rapidly, which means with more than 0.5% per year. In other terms one could say that with regard to first order cities, Belarus is moulding gradually a polycentric structure consisting of almost a dozen cities with a more or less stable development (some are growing, some are shrinking) which can be considered as important backbones for their respective oblast. Looking closer at an even lower geographic scale, it becomes obvious 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 stronger and stronger.

Such an alarming spatial trend, which is worsening gradually the degree of territorial cohesion is even stronger in NW Russia. Only very few cities have shown a stable or even positive trend. Those belonging to the latter 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' sub-urbanisation processes as the commuting distances are still increasing all over Europe. Unfortunately, we could not get any data for the other many cities surrounding St. Petersburg, such as Kolpino or Pushkin in this respect. According to Savulkin (2008), we can say at least that the entire St. Petersburg agglomeration (which includes apart from the St. Petersburg metropolis all in all 13 SMESTOs) has lost annually between 7.3 and 9.4% in the time span between 2000 and 2005. In the same period, the Leningrad oblast, which encloses the St. Petersburg agglomeration, has even lost population between 12.1 and 13.1% per year (!). Looking at the other two indicators (natural population change and net migration), the reasons for this pattern becomes more obvious. The

city of St. Petersburg itself, but also a handful of other cities, most of them located in the Leningrad and Kaliningrad oblast as well as for instance Petrozavodsk, has seen a positive net migration. The same could be observed for the settlements that are classified as 'rural population' in the Leningrad, but also Kaliningrad oblast. The reason for the negative overall picture (cf. Fig. 19) lies in the tremendous negative natural population change (cf. Fig. 20). In brief, one can say that specifically the metropolitan regions of Kaliningrad and St. Petersburg, including their larger hinterland, do indicate a dynamic performance in terms of attracting migrants. The entire NW Russian territory, however, is marked by a tremendous natural decrease of population. Only in a few aforementioned places these overall negative trend can be compensated by a considerable amount of in-migrations.

Compared to the other BSR countries, in the *Baltic States* the population trend is most negative. Roughly speaking, only Vilnius and Tallinn as well as some smaller cities in the sub-urban hinterland of Klaipeda (Lithuania) do show a stable development here. In spite of a negative net migration, the only larger city with a positive development is Tartu in the south-eastern part of Estonia caused by a positive natural population change. Worth to be mentioned is as well the fast growing band of cities at the eastern fringe of Riga. Otherwise one can realise easily an area-wide population decrease for the cities in the Baltic States with more than 10,000 inhabitants. This is caused by both, a negative natural population change as well as a negative net migration.

Figure 19: Overall population change in BSR Cities (2002-2006)

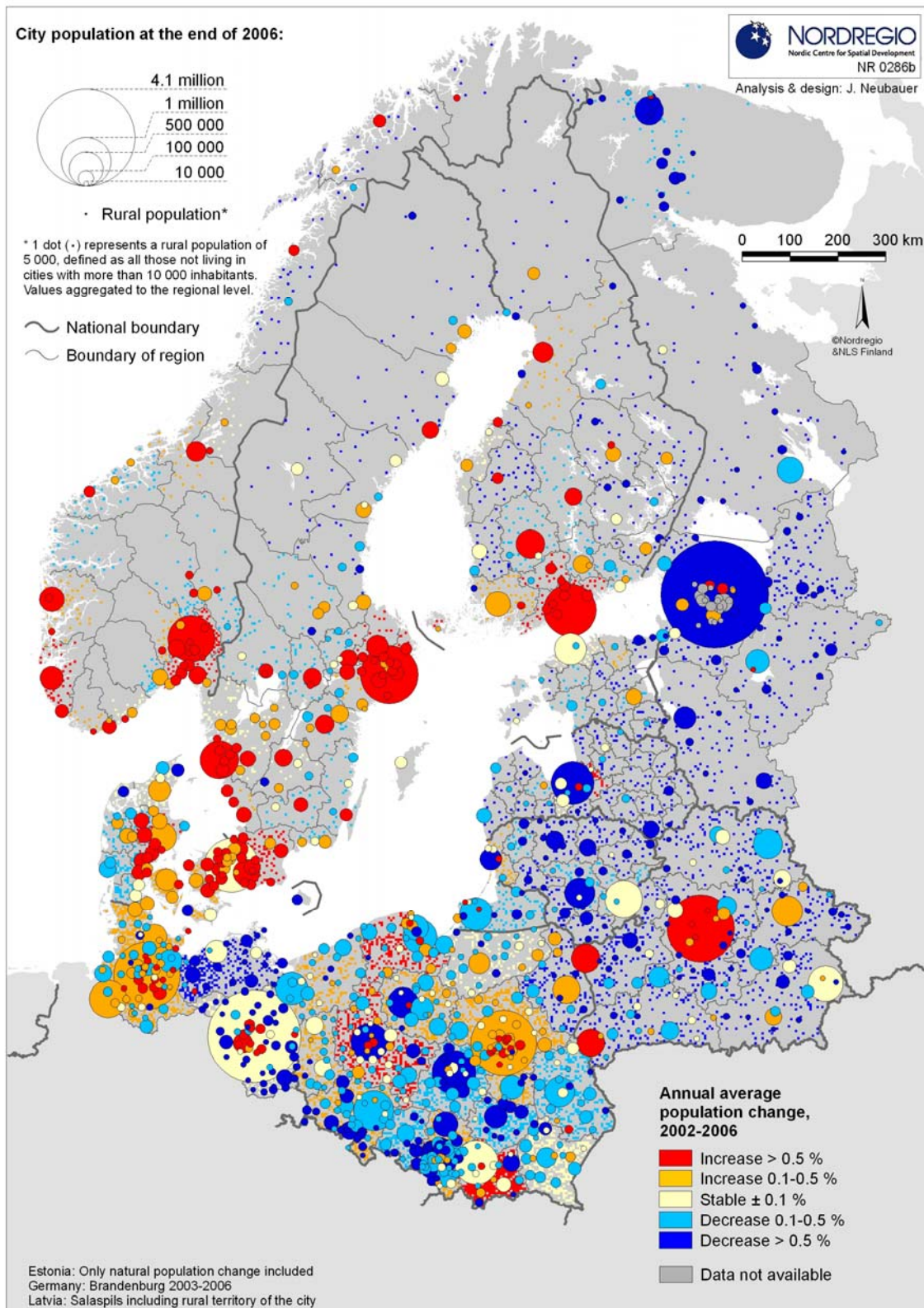


Figure 20: Natural population change in BSR Cities (2002-2006)

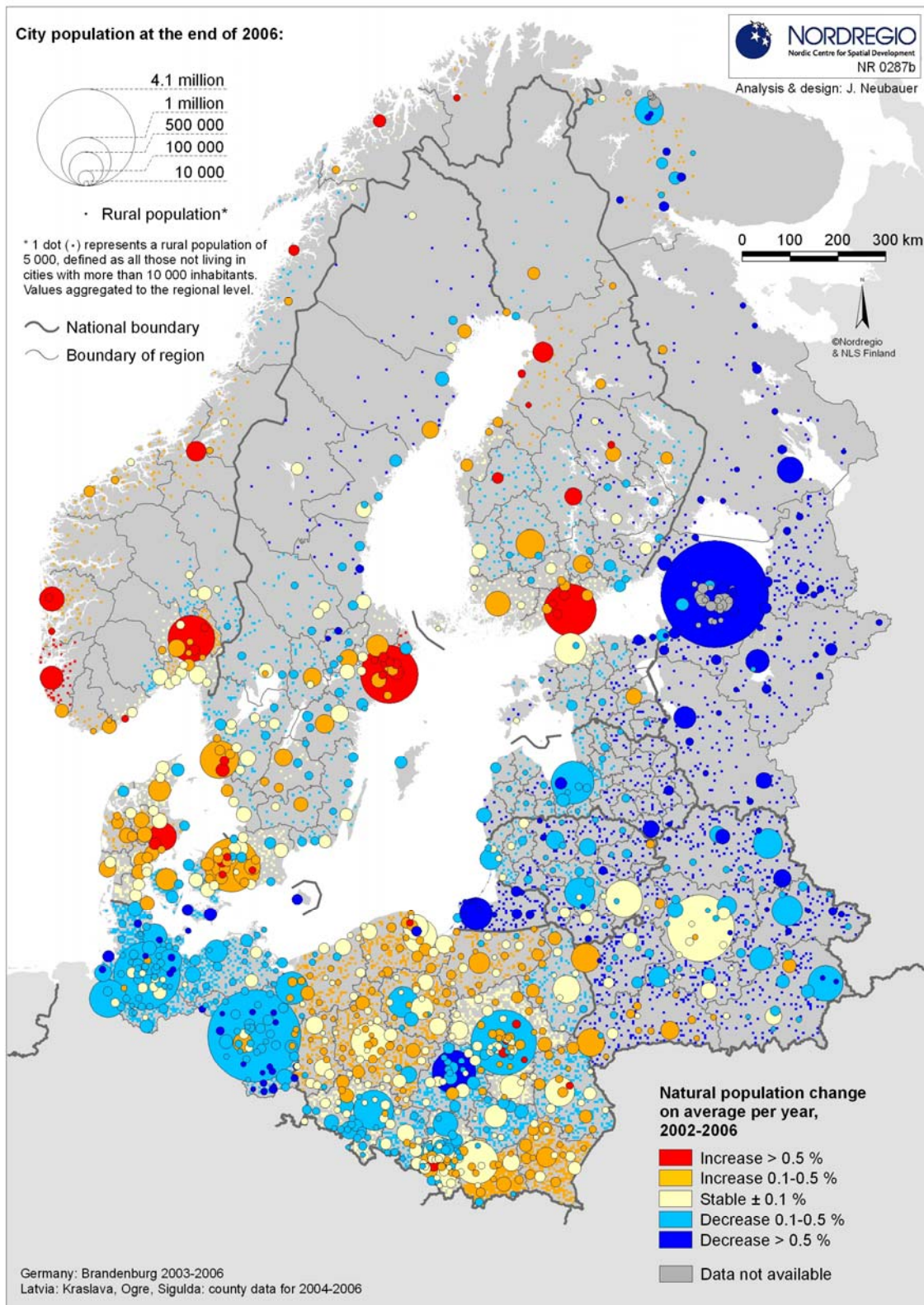
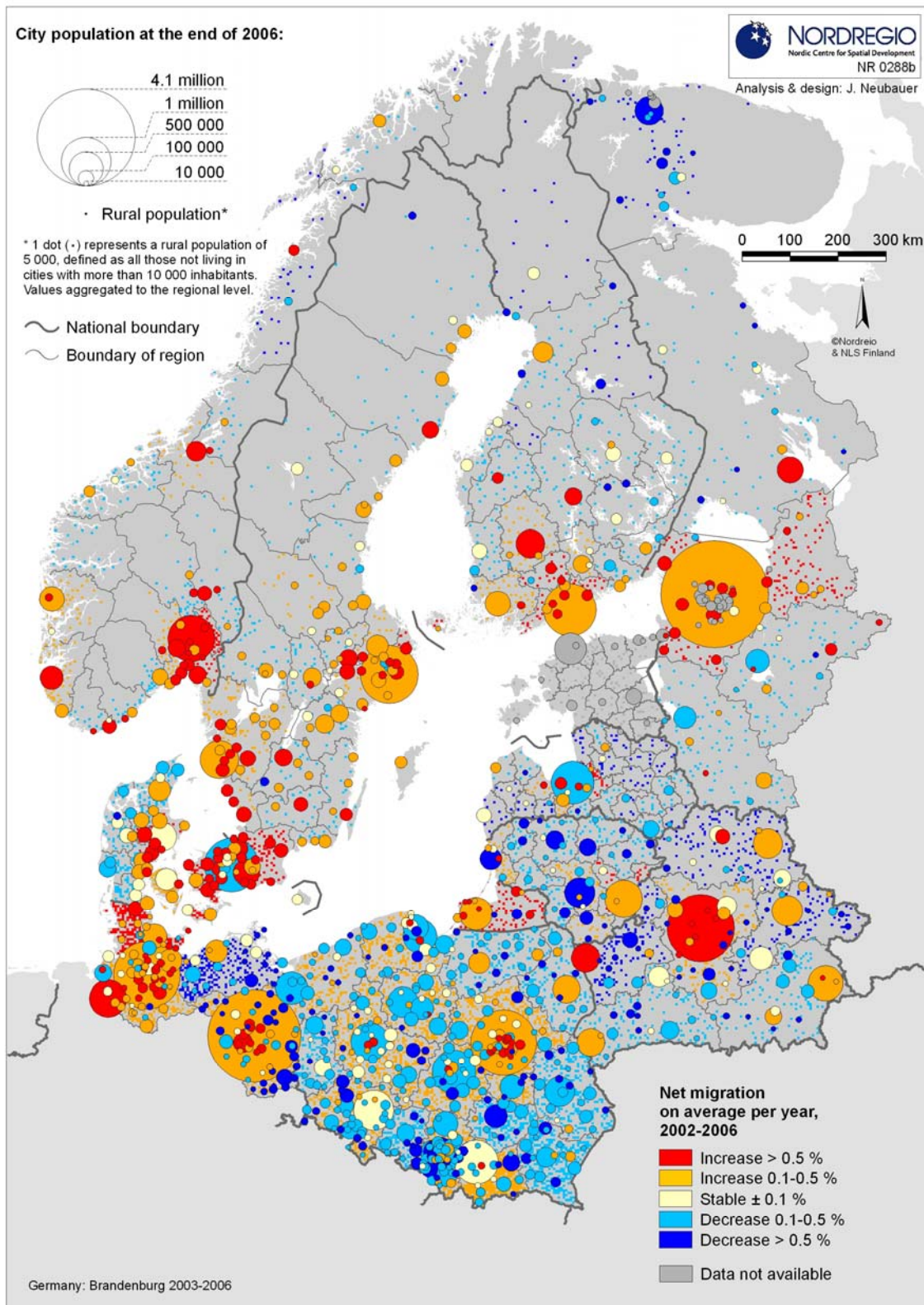


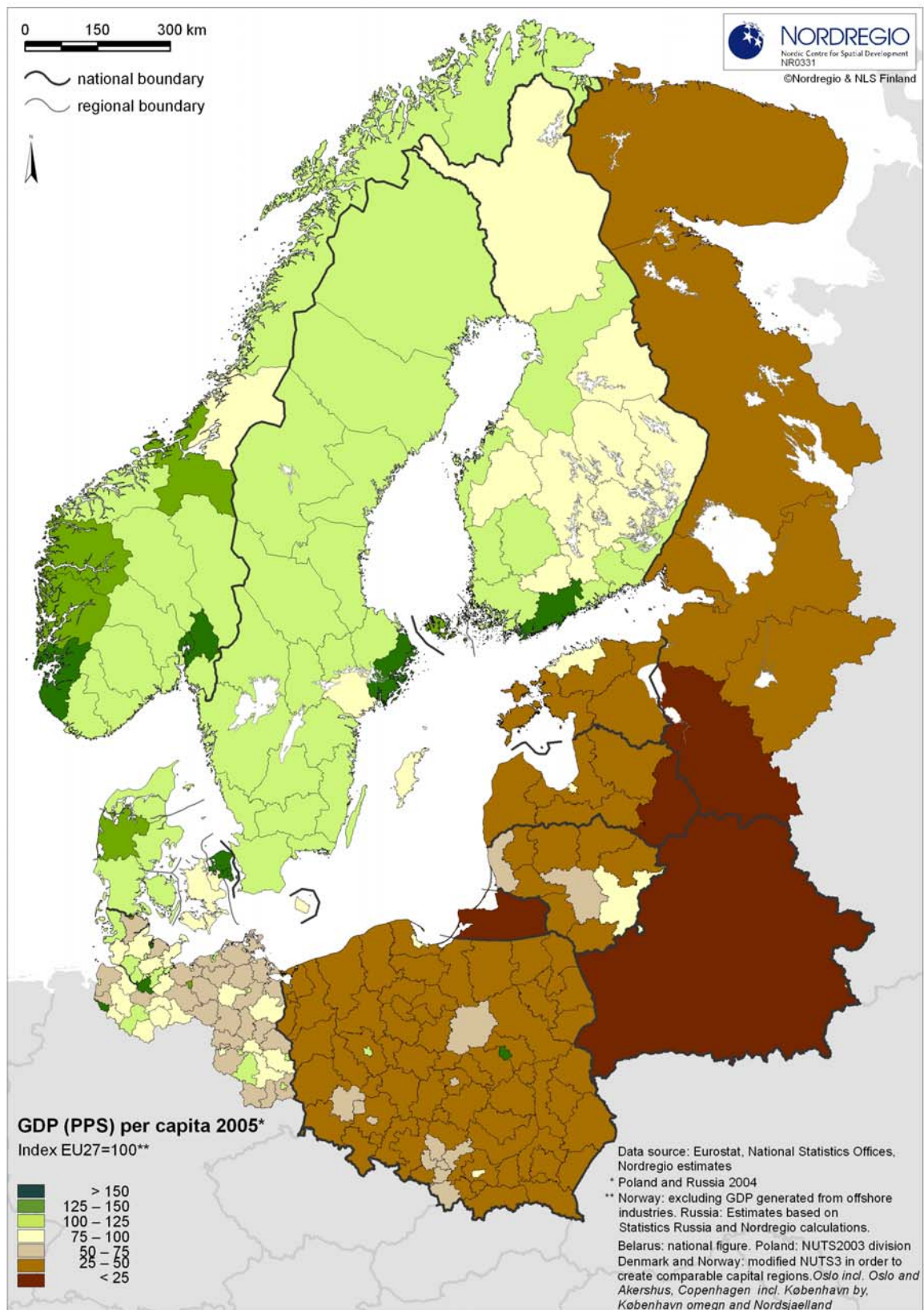
Figure 21: Net migration in BSR Cities (2002-2006)



3.1.2. Regional economic performance and dynamics on the labour markets

To get some indication regarding the most recent regional economic performance we have a closer look at the Growth Domestic Product (GDP) per capita at Purchasing Power Standards (PPS) in 2005 at the regional level. Not surprisingly, the highest GDP per capita, which shall inform about the productivity of the labour forces, is to be found in the Nordic capital metropolitan regions, in Hamburg, as well as in some regions at the Norwegian south-west coast. Apart from the latter, which is of course related to the enormous oil and gas industries there, their rather insular position can be qualified as the GDP at PPS is measured in relation to the places of work, so that those numbers do correspond very much 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 one should rather say the strong differences between the Nordic countries on the one hand (with an GDP per capita around the EU 27 average or 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 are the larger urban agglomerations where in general the more productive jobs in service industries and technology firms are located compared to less urbanised areas. This west-east divide becomes even stronger when incorporating NW Russia and Belarus, where the respective rates are partly even lower (less than 25% of the EU 27 average). Due to the, geographically spoken, relatively small NUTS 3 regions in the BSR part of Germany, the regional disparities appear extremely strong in those areas. In other terms, this means that the factual differences in GDP per capita becomes more obvious compared to those countries with larger NUTS 3 regions (e.g. Sweden).

Figure 22: 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 5) shall inform us about the level of willingness to invest in future oriented activities. Normally such investments do not have a strong impact in the short term, but rather in the long run. It is very eye-catching that specifically the capital regions as well as the other selected metropolitan regions (MEGAs) receive the lion's share of those national expenditures. This is insofar not surprising as there the most important public and private institutions are located. Nevertheless, with regard to any indications for the degree of territorial cohesion at the national level, we can see easily tremendous differences across the BSR. Particular 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 one needs to bear in mind here the urban structure of each country and particularly that in our analysis relatively large parts of the Polish territory is covered by metropolitan regions, which might explain the 11.1% dedicated to the rest of the 'other regions' here. Nevertheless, specifically the numbers for NW Russia are alarming as only 9.3 % goes to 'other regions' than to St. Petersburg and Kaliningrad.

Table 5: R&D expenditures in the BSR, in 2005
R&D expenditures (GERD) 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 expend. of Mittuniversitetet and SLU distributed to Västernorrlands and Uppsala County respectively. DK: University R&D expend. on Fyn & Sønderjylland estimated due t

*** 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.

Having a closer look at the recent dynamics on the labour markets it is very eye-catching that the employment rate is quite uneven in the BSR at the regional level (cf. Fig. 23). Not only national differences are striking, but also some specific regional characteristics. The lowest rates are for the most part to be found in most of the NW Russian and Polish regions. In Kaliningrad, however, the rate is slightly higher than the EU-27 average. The highest rates (over 75%) are to be found in South Norway, some Swedish and a very few 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 being on average in this respect. In a dynamic perspective, one can recognise that many larger cities in the BSR could increase their numbers of employed persons between 2002 and 2006 even though lots of those have lost population. Specifically in Poland, but also in the Baltic States we can observe a very positive development in this respect (cf. Fig. 24).

The unemployment rates, both at the regional and municipal level, can help to qualify these observations. Despite the above sketched positive trends specifically in Poland and in the eastern part of the German area belonging to the BSR as well as in some parts of Northern and Eastern Finland we can find comparable 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 level, including NW Russia, the Baltic States and Belarus, are rather moderate. Concerning the later, together with western Estonia and the most part of Norway, the unemployment rates are even below the EU 27 average (cf. Fig. 25 and 26).

To sum up, it seems that the labour markets in the cities and regions in the Eastern part of the Baltic Sea are slightly catching up with those in the western part. With specific regard to the developments in the BSR's cities, one can rather detect a north-south divide as specifically in Poland, but as well in many cities belonging to the German part of the BSR are suffering from high unemployment rates. To turn that in a more political language one could say that there are enormous unused potentials in terms of the available labour forces. Having a look at the negative numbers on net migrations in most of these cities, it seems that these labour forces are increasingly moving to other regions within the country or even outside. Hence it appears to be urgent to find economic alternatives for those cities in order to stop this downward spiral that is composed by for the most part high unemployment, comparatively low birth rates and high numbers of out-migration.

Figure 23: Employment rate in the BSR at regional level

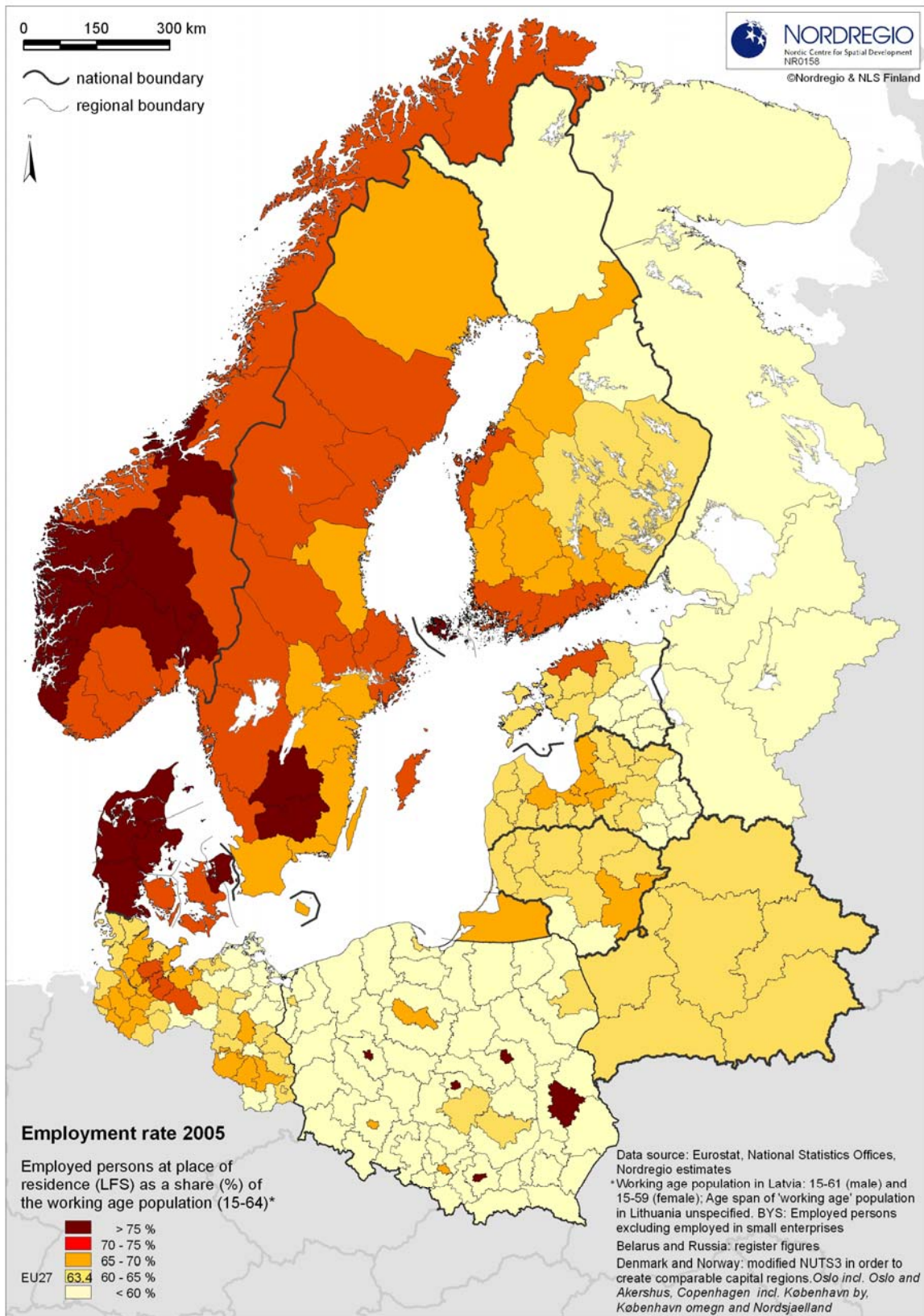


Figure 24: Change in employment rate in the BSR cities (2002-2006)

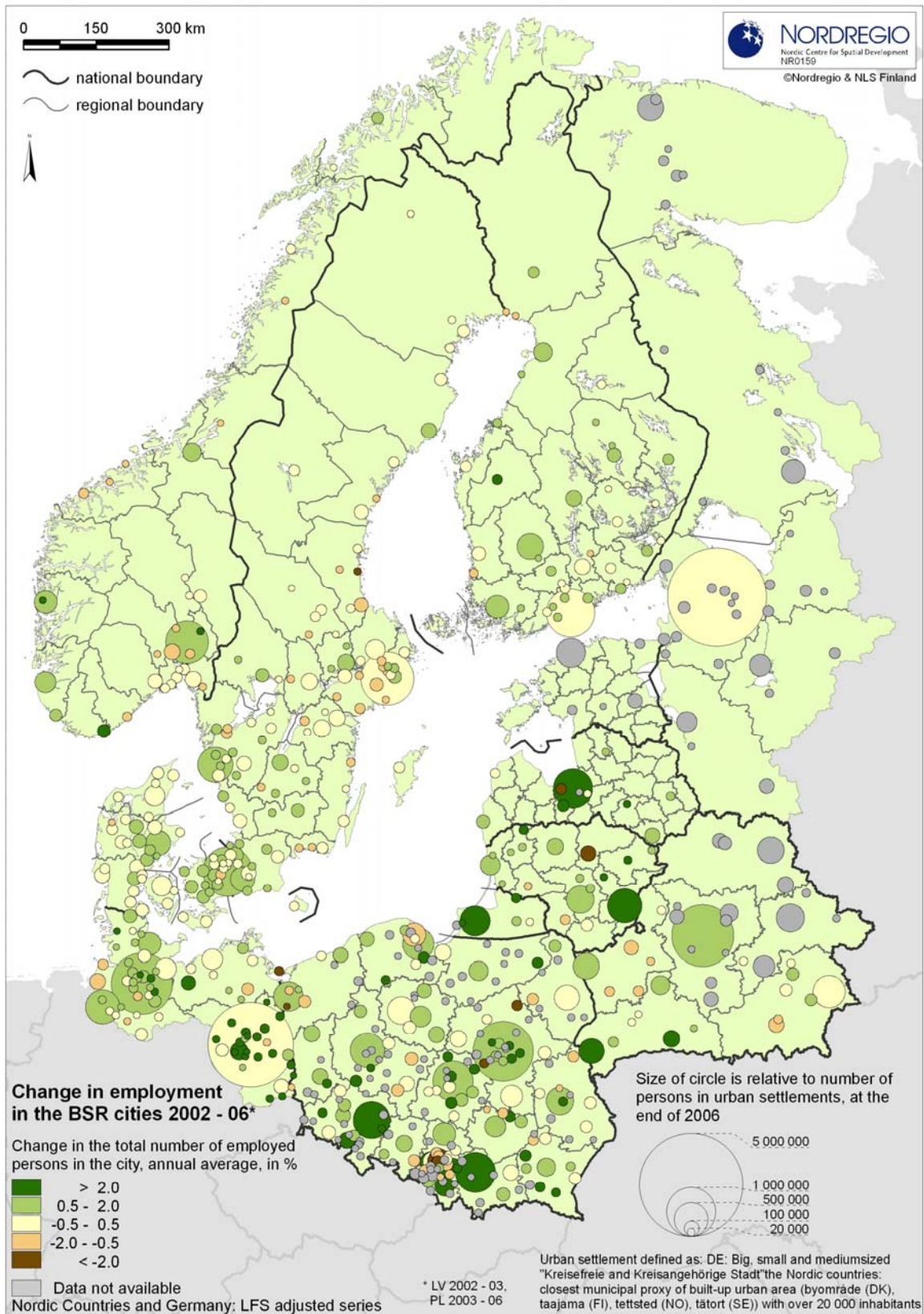


Figure 25: Unemployment rate in the BSR at regional level

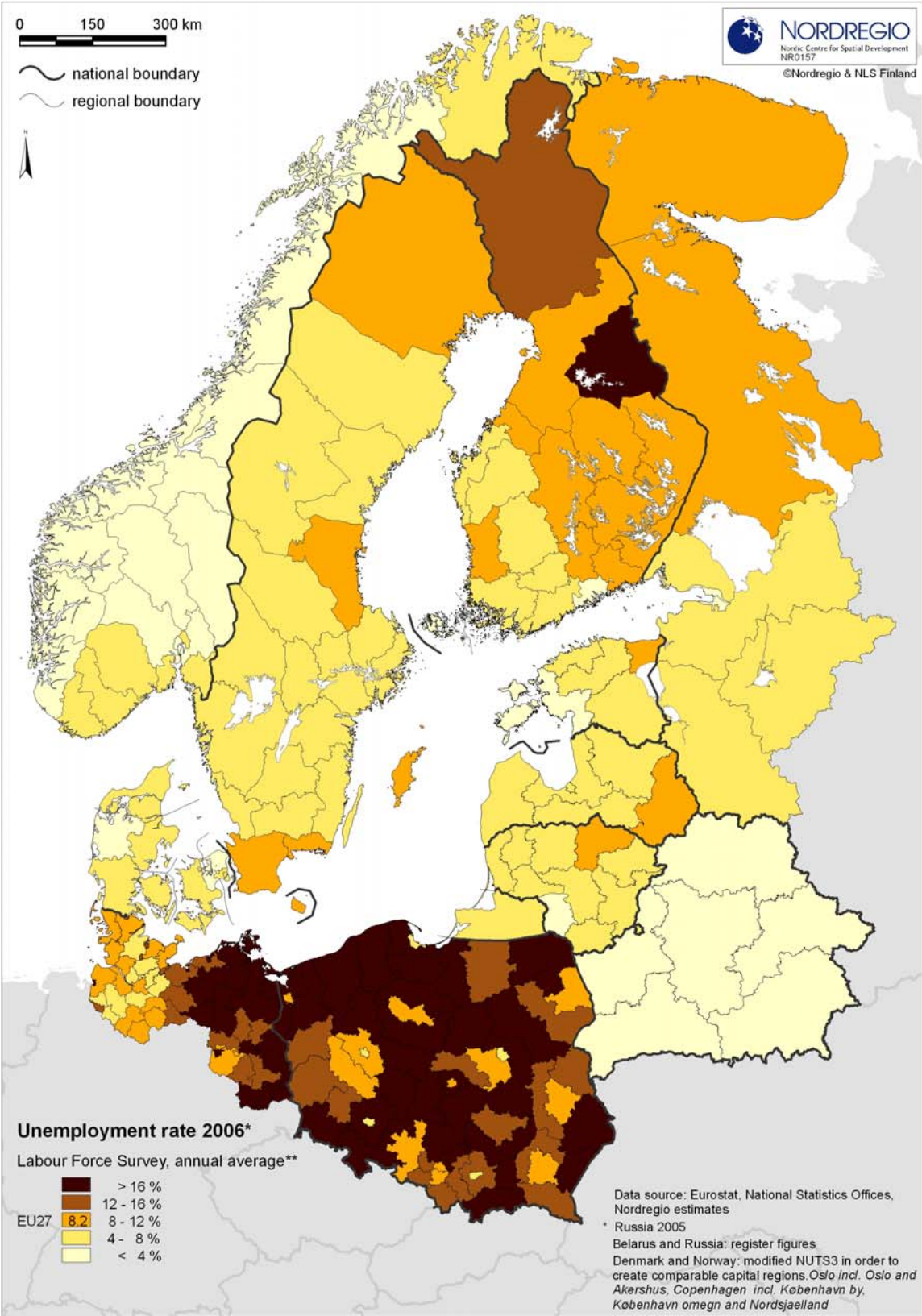
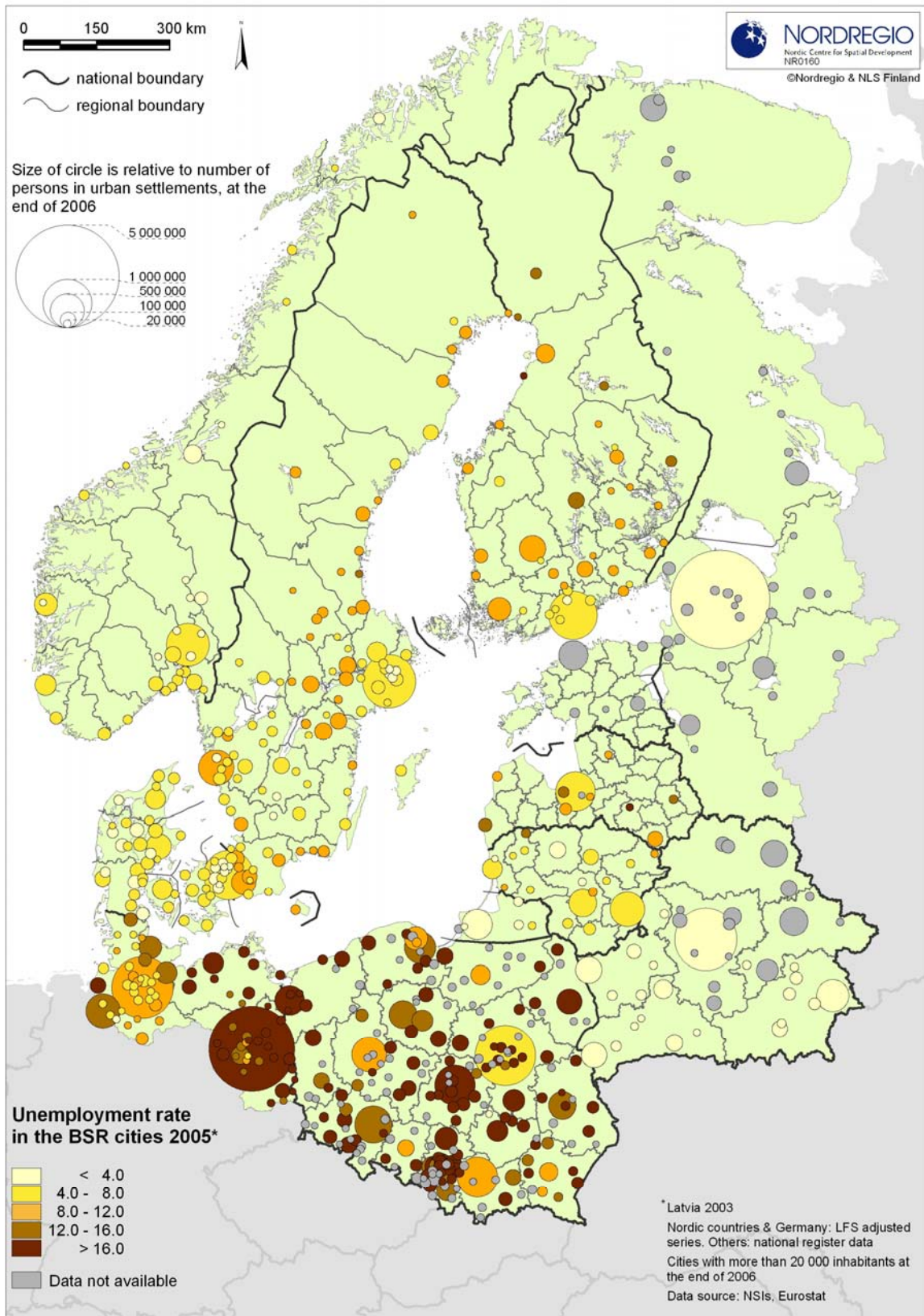


Figure 26: Unemployment rate in the BSR cities

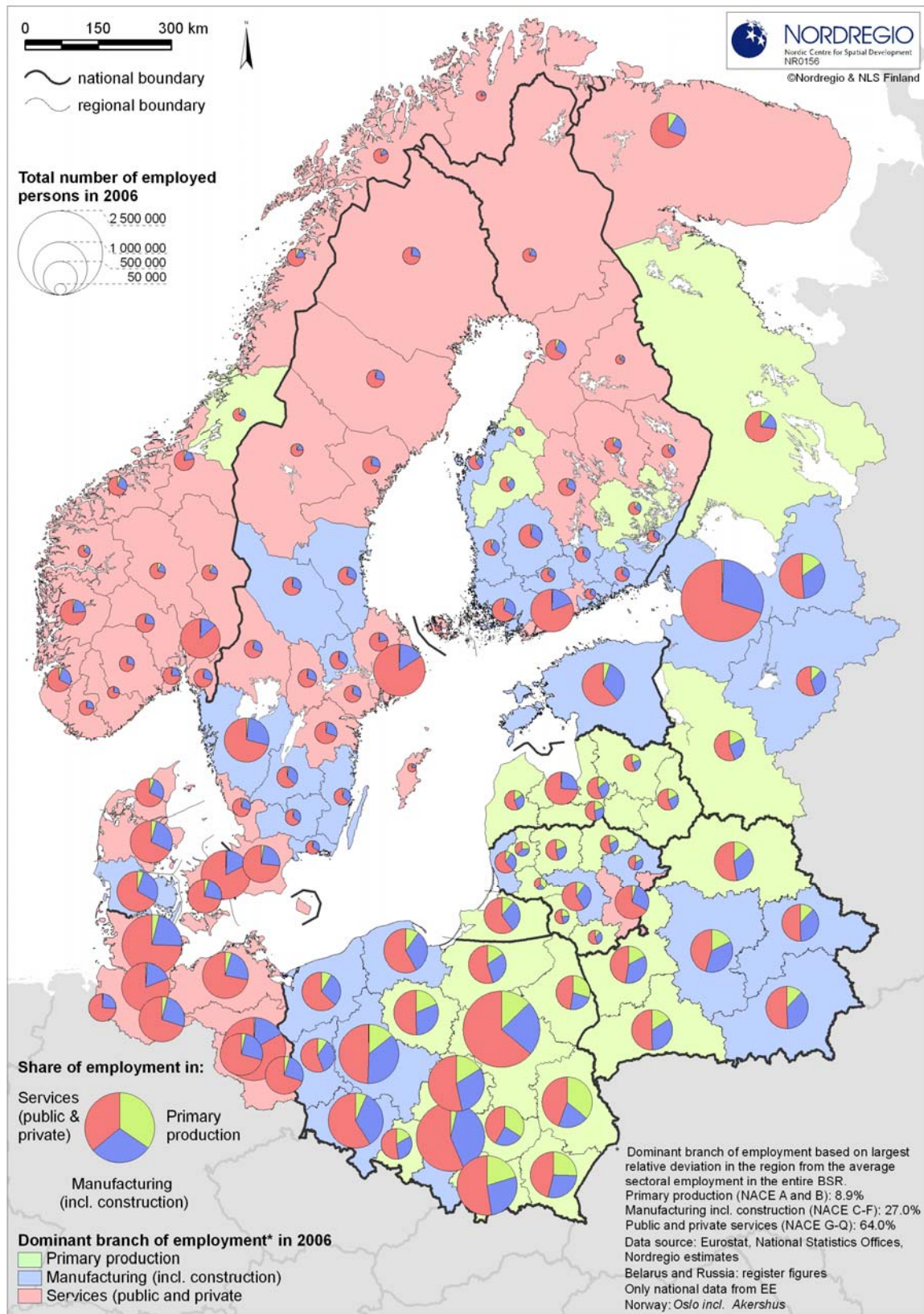


Finally, we have a closer look at the share of the three basic employment branches (primary production, manufacturing and services). Figure 27 depicts the current (2006) employment structure across the entire region. The colours of the regions refer to the branch that has the largest relative deviation 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). At first, it is very eye-catching that services (public and private) are the largest source of employment in all BSR regions. As to expect there are national and of course regional differences, 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 regarding certain agricultural or manufacturing products.

From the relative dominance of branches of employment based on the largest regional deviation from the average sectoral employment in the entire BSR we can learn something about the relative degree of regional specialisation in relation to the rest of the BSR. In comparison to the results provided with the same approach by Hanell/Neubauer (2005) with data of 2001, 2002 and 2003 one can observe some slight differences. In Western Poland some regions are now relatively dominated by manufacturing instead of primary production before. The same slight shift can be observed for some regions in Eastern Lithuania and for one region in Eastern Belarus. The overall percentage for the entire BSR regarding the share of employment in manufacturing has been rather stable (27.2% in 2006 compared to 27.0% in the years 2001, 2002, 2003), whereas the percentage concerning public and private services has been increased (now 64.0%, before that 62.9%) and that of primary production has been decreased (from 9.9 to 8.9). Regions that have been relatively dominated by manufacturing as identified in the report by Hanell/Neubauer (2005) and that are now dominated by services are rarely to be found. Exceptions are 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 has also to be mentioned that except for the Riga region, all other regions in Latvia seem to be relatively dominated by primary production now, whereas before it was for the most part manufacturing, and partly services (cf. Hanell/Neubauer 2005). This change is rather caused by a statistical effect, as one needs to bear in mind that different delimitations of regions and other data source have been used then. The relative dominance of services in the sparsely populated areas in the Nordic Countries can be explained by a relative strong representation of particularly 'public' services as a strong alternative economic path to the weak development of manufacturing production and the minor standing of agricultural production due to the climatic pre-conditions there.

Nevertheless the map below gives some good indications about the state of the economic transformation process of many regions in the Eastern part of the BSR as they are still relatively dominated by primary production.

Figure 27: Dominant branch of employment in the BSR at the regional level



3.1.3. Future demographic trends

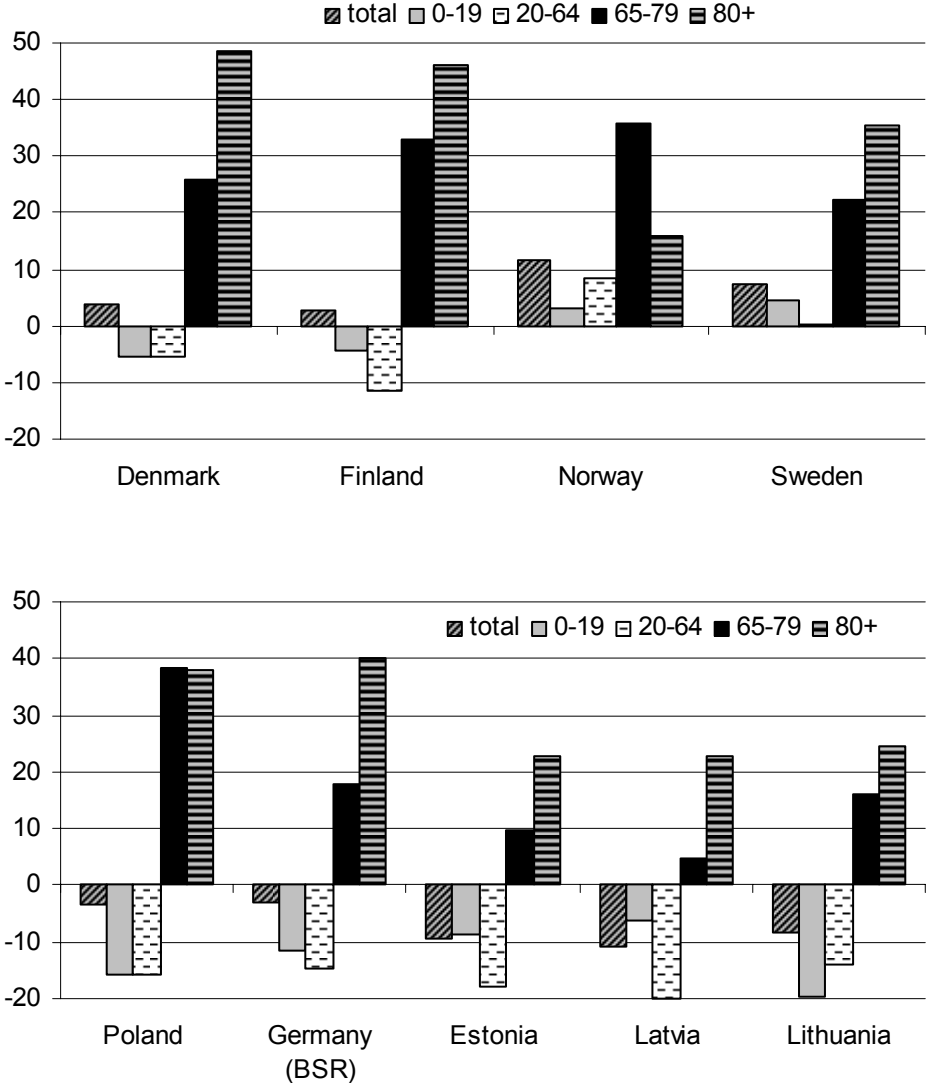
In order to get an understanding of future demographic trends and its likely territorial implications, we have gathered and edited some inputs and findings provided by the national experts of WG 1. Comparing these inputs and findings it becomes obvious that the BSR is facing a strong demographic challenge. Apart from the Nordic countries, one can anticipate a general decrease of the overall population. Most drastically will this decrease hamper rural and peripheral areas as well as areas that are characterised by somewhat isolated SMESTOs. Stable developments are fairly to be expected in the larger metropolitan regions – some of them will even increase their population. One needs to distinguish here, however, if a 'real gain' is to be expected or if we rather may observe a kind of spatial transformation within a country due to strong domestic migrations towards the metropolitan regions. Also in many cases, we can only expect a positive trend in the metropolitan fringes or hinterland due to ongoing sub-urbanisation, whilst at the time we will see rather stable or even negative trends in the metropolitan cores.

When analysing the population development in the Baltic Sea region until 2030 three universal trends are worth to be noted (cf. figure 28).

- The Nordic countries (Denmark, Finland, Norway and Sweden) will have increasing populations while the other BSR countries and areas will experience a population decline.
- In all BSR countries and areas the two eldest age groups (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 groups (0-19 and 20-64) will decrease their share of the overall population in the BSR.

The basic driving force of the overall negative trend and their territorial impacts in the BSR is the low birth rate in most of the countries (cf. table 8), which can only be compensated in some regions by in-migration. It is also worth mentioning that many countries and regions will be hampered by out-migration not necessarily to other BSR countries, but increasingly to other European countries. Because of this, most of the cities and regions in 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 in pension age). Such a development is not necessarily unique in Europe, as also other regions, countries or even transnational areas will face the same challenge in the next decades. Nevertheless, this tremendous demographic transformation does (and increasingly will) confront most of the cities and regions in the BSR.

Figure 28: The relative change in total population and for 4 age groups, in per cent, for the countries and areas in the Baltic Sea Region 2010-2030



Source: Estimations based on Eurostat, calculated by Rauhut (2008)⁵

⁵ The calculations in figure 29 are made in an analogous way for the figures 30-33. Due to the lack of harmonised data, calculations for Belarus and the Russian part of the BSR are not possible.

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

Table 6: 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 those numbers presented in Fig. 28 and Table 6 as well as those which have already been discussed in chapter 3.1.1 one needs to bear in mind that the BSR is, as other places in Europe too, in a so-called advanced demographic transformation process. This process is characterised by substantial changes regarding some basic demographic elements, such as birth and mortality rates, complex migration patterns, and both creation and disintegration of families and households. Indications of this transformation are 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 as well as international migration processes, which all have been indicated in the one or other report provided by the national experts (see edited excerpts below).

In addition, some further social and societal changes have to be mentioned in this context. To spotlight here is for instance the rising competition on the labour market, the aspirations of young people to attain a higher professional status, the growing costs of education, both the growing costs of education, both both the growing costs of education, both for adults and children, and the overall growing socio-economic stratification of society. Other conditions that will increasingly influence the demographic development are the high risk of unemployment, a shortage of available housings, a lack of possibilities to combine family and work/education and a decrease of social benefits granted directly or indirectly to families and households as they all effect negatively the matrimonial behaviour and finally the birth of children, first in the cities, but increasingly also in the countryside. Other issues that will have a great impact on future demographic developments and which are more or less distinct in the one or the other country/region/city in the BSR are 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 bunch 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, do challenge the competitiveness of most of the cities and regions in the BSR. Those issues can, however, not be explored systematically in this report. This would have gone beyond the scope of the EWW-project.

In the following, we will discuss these findings (see above) in a more detailed way and extract some further trends by visiting briefly three BSR sub-regions: the Nordic Countries (Norway, Sweden, Finland and Denmark), the Southern Arc (BSR part of Germany, Poland and Belarus), and finally the Baltic States plus NW Russia (including the Kaliningrad region).

3.1.3.1 The Nordic Countries⁶

The estimations by Eurostat, the national statistics offices in the Nordic countries and 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 and 2030. In Norway and Sweden, however, the number of persons 0-19 years old will continue to increase generally in the southern and urbanised regions, whilst this age group will decrease in numbers in the northern and rural/peripheral regions. A similar development can be predicted for the age group 20-64. This one will decrease its numbers in all regions in Denmark and Finland. In Norway the age group 20-64 will increase in all regions but Nordland; in Sweden this age group will increase in the metropolitan regions Stockholm, Västra Götaland and Skåne, while decrease in all other regions. The age groups 65-79 and 80+ years will increase in all Nordic regions. The increase is especially marked in the age group 80+ years and in some regions where the persons aged 80+ will almost double its numbers between 2010 and 2030.

In **Denmark** the total population in Sjælland and Midtjylland will increase as a share of the total Danish population between 2010 and 2030. At the same, time the population in Hovedstaden (the larger Copenhagen region), Syddanmark and Nordjylland, as a

⁶ Abstract bases upon Rauhut (2008)

share of the total Danish population, will decrease between 2010 and 2030. The population in Landsdel Bornholm will face a more significant decrease as a share of the total Danish population 2010-2030. The small decrease in the share of population living in the municipality of Copenhagen (part of Hovedstaden) can be explained by an increased regional enlargement in the Øresund region: while the municipality of Copenhagen is decreasing, Sjælland is increasing its share of the Danish population and so is the Swedish region Skåne. Midtjylland, with the metropolitan area of Aarhus, is increasing its share of the Danish population, while rural and peripheral regions – Nordjylland, Syddanmark and Landsdel Bornholm – are decreasing their shares of the Danish population in 2030. In general one can say that between 2010 and 2030 the Danish population will be more concentrated around the metropolitan regions of Copenhagen and Aarhus.

In **Finland** the total population in Etelä-Suomi and Åland will increase as a share of the total Finish population between 2010 and 2030. At the same time, the population in Itä-Suomi and Pohjois-Suomi as a share of the total Finish population will decrease between 2010 and 2030. The population in Länsi-Suomi will face a more or less constant share of the total Finish population 2010-2030. The process of an ageing population will be marked specifically in Itä-Suomi and Pohjois-Suomi. In the metropolitan regions of Etelä-Suomi and in Länsi-Suomi this process is 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 Finish population will be more concentrated around the metropolitan regions 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 decrease as a share of the total Swedish population 2010-2030. While the NUTS

2 regions Västsverige and Sydsverige will experience a positive development of the age structure, the rural and peripheral regions Östra Mellansverige, Norra Mellansverige, Mellersta Norrland, Övre Norrland and Småland with islands will experience the opposite. Between 2010 and 2030 the Swedish population will be more concentrated around the metropolitan regions of Stockholm, Göteborg (Västsverige) and Malmö (Sydsverige).

In a nutshell one can 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 regions will have a population structure similar to what we see 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 regions will be the growth poles in this respect, which will aggravate the uneven urban geography in each of these countries.

3.1.3.2 The Southern Arc

In contrast to the Nordic countries, in Germany, Poland and Belarus a strong demographic transformation has already started towards a shrinking population, which will become even stronger in the future. An exception might be to some extent Belarus, if one believes in the existing national future scenarios, as they base on a very speculative assumption, namely that very strong in-migration will compensate the natural decrease of the population. Regarding the situation in the BSR part of Germany, and here specifically in the eastern areas, the situation will become even more dramatic in the future than it is now the case. Poland will not only suffer from a very low birth rate (such as the BSR part of Germany), but also, and this is rather unique, it will be hampered as well by strong out-migration (cf. chapter 3.1.1). Here one may assume that particularly well educated labour forces will increasingly 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 compete increasingly on international markets. Stable developments are rather to be expected in the larger metropolitan regions in Germany and Belarus (here very often rather at their fringes than in the cores) due to domestic migrations towards those centres at the expenses of SMESTOs 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 former rural areas more and more to

urbanised landscapes at the expenses of these bigger cities, which themselves will see an ongoing population decline (cf. chapter 3.1.1).

GERMANY⁷

In Germany we can easily identify a strong difference in terms of population dynamics between the Western and the Eastern areas belonging to the BSR part of Germany, namely an increasing population on the one hand and a decreasing one on the other. At a closer look, these dynamics become increasingly an insular phenomena. Here specifically in the Eastern BSR part mainly rural areas in a remote location are characterised by the most negative development compared to the rest of the entire 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 are the BSR metropolitan regions Hamburg and Bremen with, however, a limited dynamic.

Overall we will observe a strong reduction of the population. In 2050, Germany will count between 68.5 million and 75 million inhabitants according to BBR (Bundesamt für Bauwesen und Raumordnung) population projections (today 82.5 million), which will specifically affect the part belonging to the BSR. What is striking is the decline of the natural population dynamic in the Western part of the German BSR, which will be in the long run 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 have the most significant natural population decline in Germany.

The greying process of the population is an overall phenomenon concerning East and West Germany. However, we need to distinguish once again between suburban and rural areas on the one hand and cities on the other hand. In suburban and rural areas, people will get "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. Regarding the regions being part of the BSR, it is necessary to point out the future increase in population being older than 75, especially in Mecklenburg-Vorpommern, Brandenburg, parts of Schleswig-Holstein and Lower Saxony. Compared to them, the metropolitan regions of Berlin, Hamburg and Bremen will be better off than their larger rural hinterlands.

⁷ Abstract bases upon Manz (2008a)

POLAND⁸

Due to the social and economic systemic transformation the demographic prognosis for Poland for the years 2003-2030, prepared by experts of 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 is an incomplete process and will increasingly concern consecutive generations of young people. This trend is basically caused by a growing level of education, problems on the labour market, reduction of social benefits for the family, an absence of pro-family social policies, and generally difficult socio-economic conditions in which the generation of reproductive age has found itself.

According to the experts' opinion, the Polish society will shrink from its present number of over 38 million to about 35 million in 2030, becoming a society with considerably more elderly citizens than at this time. Experts also believe that in the years to come the scale of external migrations will increase, with a negative overall balance. 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 the membership in the European Union may provide a new impulse to this.

The aging of Polish society will gain momentum in the second decade, which results to nearly 2 million more people at retirement age in 2020 in comparison to the year 2000. At that time, the post-war boom generation will reach retirement age. The process will also feature so-called 'double aging', as the number of the oldest citizens, aged 80 and up, will increase 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 rate, and natural reshuffles in age structure.

BELARUS⁹

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

⁸ Abstract bases upon Dutkowski (2008a)

⁹ Abstract bases upon Semenkevich (2008a)

male population, due to increased smoking and alcoholism. In 2005 expected 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 age structure will change. This means that in the forthcoming years the overall labour force will grow at first, but later on decrease substantially. A growth of the older population will cause an increase of the death rate, and decline of the economic activity, the labour capacity, and consequentially lead to an increase of 'demographic load' on the actual working population, so that the State has to raise its expenses for the social sector. Regarding the further future development, two different forecast models have been developed.

- The 'Inertial model': The low birth rate will continue and does not provide the replacement of the current parental generation. The natural decrease of the population will continue and the high death rates will grow further. The migration surpluses will further 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 'Model of stabilization': This model bases on an successful implementation of several political measures to improve the conditions for families, the health care sector and an efficient enlightenment of the population on possible health threats as well as an optimisation of inner and external migration. This shall contribute to a reversal of the negative natural population development, so that by the year 2020 the overall population number shall reach 12.5 to 13.0 millions inhabitants.

In both models the growth of the population is forecasted. The main factor of this growth will be migration that would over compensate the natural decrease of the population, which is of course, of rather speculative nature. The rate of urban citizens will increase during all forecasted period, whereas the rural population will continue to shrink due to a high death rate and ongoing migration from the rural settlements to the cities.

3.1.3.3 The Baltic States plus NW Russia

Compared to the countries that constitute the Southern arc of the BSR, one can roughly predict the same future trends for the Baltic States (here only Latvia and Lithuania, no data received for Estonia) and NW Russia. In other terms, a general strong shrinkage of population is to be expected. Even the 'optimistic variants' of

national or European forecasts anticipate a general decline for the entire region, with only a few positive developing places. These are specifically to be found at the fringes of the larger metropolitan regions, whereas the cores of these metropolitan regions will shrink or (at best) stabilize their amount of inhabitants. The losers are, apart from a few exceptions, once again those SMESTOs at a certain far distance to the metropolitan regions as well as their rural hinterland in-between.

***Latvia*¹⁰**

According to Bērziņš (2007) the most reliable version of the demographic prognosis has been done by the Central Statistical Bureau of Latvia (Ušackis, 2007). Regional prospects have been made, however, without assessing the impacts of territorial reforms on cities and regions. Until the year 2050 a 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 until the year 2050 according to the 'basic version' of the population forecast by the Central Statistical Bureau of Latvia. It has also been calculated a 'high version' projection, which includes a higher fertility and stronger in-migration into the country. Here the population might increase up to 2.4 million in 2050 compared to the 'low version' projection that suggests for the same period a drop to 1.51 million inhabitants. In the latter only in the hinterland of Riga, the statistical region of Pierīga, an increase of population 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 is according to Bērziņš the most realistic one, the following hypothetical presumptions are included: the overall birth rate increases from 1.28 (now) up to 1.59 in the year 2030 and stabilize by 1.60 in the period from 2030 to 2050. The life expectancy is projected for males to increase from 64.9 to 70.9 in the year 2030 and to 74.3 in the year 2050. For females, an increase is calculated from 76.2 to 80.4 in the year 2030 and to 82.5 in the year 2050. International migration in the basic version has been forecasted to be negative — in average on balance up to 4,700 per year would leave the country during the period between 2012 and 2013. In the following years a negative net migration will gradually diminish and

¹⁰ Abstract bases upon Kule (2008a)

after the year 2020 it will be (in average on balance + 3,000 per year) (Zvidriņš, 2005; Bērziņš, 2007). Causes for continuous decrease of population are exceptionally low birth rates. This lack of children will continue and thus create various economic and social problems in the future: an adaptation of the child care and school system due to an insufficient utilization as well as a shortage of working force and students at universities. The sharpest decrease of labour force (persons 15-64 years old) in 2005-2030 is expected in Latgale (-31.2%), Kurzeme (-23.1%) and in the city of Riga (-19.9%). Only in the Pierīga region the number of working age persons will stay unchanged with a slight increase (+1.2%) up to the year 2030 (Bērziņš 2007).

The share of population in working age will decrease in average from 68.9% in the year 2010 to 63.7 in 2030 in Latvia, with the most crucial decrease to be observed in Latgale (62.0%) and in the city of Riga (62.8%). On the other hand, due to the spatial transformation process between Riga and its hinterland, the Pierīga region will get a larger share of the overall Latvian labour force, from 16.0% (2010) to 19.9% (2030). In total Riga and Pierīga regions will make 51.8% of the whole Latvian labour force in the year 2030, which underlines the growing regional disparities within the country.

After 2010 in all Latvian regions a kind of greying process will occur as the total number of people older than 65 years will increase by +12.7% in the year 2030 compared to the year 2005. In the period 2005-2020 the total number of old inhabitants (above the age of 65) will stay unchanged, except in Pierīga a raise 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 be risen by 16.6% compared to the year 2020, and will then hold the highest share of the age group in the country.

Lithuania¹¹

According to a recent projection by EUROSTAT, Lithuania will see a continuation of a negative population development in 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 is, compared to other European countries, a very low birth rate. At the same time it is projected that the number 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

¹¹ The short abstract bases upon a table provided by the Lithuanian national expert. Unfortunately, no further information about the territorial consequences has been delivered. No information has been provided for Estonia due to the absence of an Estonian expert in the WG.

countries too, the numbers of old people (>65 years) will increase. Similar to the situation in Latvia, the low birth rates will first affect negatively a strong decrease of the number of children and with a slight time shift the numbers of people in working age. It is forecasted, however, that the numbers of old people will continue to increase up to 2030, and then even beyond up to 2060.

NW Russia and Kaliningrad¹²

The regional pattern within the North-Western federal area (NWFA) has its specific structure and peculiarities. Firstly, it is eye-catching that the northern part, formed by Murmansk and Arkhangelsk regions, the Republic of Komi and the northern part of Karelia, is a region with a current drastic population decrease. The Russian population of the Republic of Komi just passed the stage of demographic transition (transition from the high birth rate to the low one), while national minorities of these territories keep the traditional stereotype of reproduction (high birth rate). That is why the demographic situation is more stable in territories where the local population of the North live. In territories where the Russian population lives, a serious reduction in the population is being observed. The next clear element of the structure of settlement system is to be found in the west of Leningrad region and 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 practically the reverse 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 left by people. In this regard, the migration attractiveness of Novgorod and Pskov regions is not very high. Here Kaliningrad and Leningrad region, and especially territories around St. Petersburg, are in an outstanding position as they seem to attract people to these southern areas of the NWFA (Strategic Developments Centre North-West 2002).

Most of the regions in NW Russia have seen a tremendous decline in the time-span 1990 to 2005. The only exception is the Kaliningrad region, which, however, will struggle in the future with a somewhat shrinking population (see below). The strongest decline can be noted in the northernmost Murmansk region, whereas the degree of shrinking is rather modest in St. Petersburg and the neighbouring Leningrad region.

Looking at the natural population ratio, it becomes obvious that the Murmansk region has lost most of population due to strong out-migration as the birth and mortality rates are almost balanced. Whereas the Leningrad region (as partly constituting the suburban hinterland of St. Petersburg), for instance, could apparently compensate a negative natural population ratio by a strong influx of migration.

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

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

The optimistic variant of demographic forecast in the NWFA implies a growth of population in the Leningrad agglomeration (including St. Petersburg, Leningrad, Novgorod and Pskov regions), which is caused 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 (as for Belarus too) rather of speculative nature. A stabilisation of the entire NWFA would be possible at the level of 14 million people, which is only 3% lower than the figure of the year 2000 (Strategic Developments Centre North-West 2002).

The resulting figures of the assessment of the demographic forecasts show that in the year 2005, in the NWFA, if the pessimistic variant of situation development takes place, the population of the area would reduce by more than 25% compared to the year 2000, and will amount then to 10.7 million people. If the middle variant takes place implying a growth of the birth rate and a decrease of the death rate while keeping migration rates at the level of the year 2000, the population of the NWFA would be reduced anyhow to 12.6 million people. In other terms the 270,000 migrants, which,

¹² Abstract bases upon Savulkin (2008)

according to this forecast, would move to the NWFA, will not compensate the overall reduction of population. A dynamic development of the larger St. Petersburg agglomeration, as well as of Karelia and Kaliningrad, have to be considered here as the potential backbone for such expected migrations of labour forces, which makes once again obvious the outstanding importance of these regions for the future of the entire BSR as such (cf. chapter 2). To keep the population of the NWFA at the level of 14 million people by the year 2025, the number of migrants should amount to 1.5-2.0 million people, which seems, according to experts, quite probably.

Excursus: Population forecast for SMESTOs in the Kaliningrad region¹³

The following analysis regarding the future demographic development of SMESTOs at the micro-scale shall exemplify the urgency of a 'demographic strategy'. The example is therefore striking as the Kaliningrad region is not necessarily an area which will be hampered at most by the overall negative demographic development in the largest parts of the BSR (see above).

The Kaliningrad region is one of the most urbanised regions of Russia. The share of the urban population amounts 77 %. The city of Kaliningrad concentrates 45% of the regional population (i.e. 422,000 inhabitants in 2007). The rest of the urban settlements are comparatively small. They include 20 towns and three settlements of urban type with a population from 3,000 to 43,000 people. These towns and settlements are inhabited by 32 % of the population of the region. For further investigations four of such medium sized towns of the Kaliningrad region have been selected: Svetly, Sovietsk, Chernyakhovsk and Gusev.¹⁴

Table 7: Average annual rate of growth (loss) of population according to types of settlements, in %

| Types of settlements | 1959-1970 | 1970-1979 | 1979-1989 | 1989-2002 | 2002-2007 |
|-------------------------|-----------|-----------|-----------|-----------|-----------|
| Kaliningrad | 4.2 | 2.2 | 1.3 | 0.5 | -0.35 |
| Semi-medium sized towns | 3.0 | 1.0 | 1.0 | 0.6 | -0.46 |
| Small urban settlements | 1.8 | 1.2 | 0.9 | 0.7 | -0.62 |
| Countryside | -0.9 | -0.2 | -0.5 | 1.2 | -0.16 |

Source: *Emelianova/Fedorov (2008)*

¹³ Abstract bases upon Emelianova/Fedorov (2008)
¹⁴ Note that the same four cities have been taken as SMESTO show cases in the appendix.

Table 8: Population dynamics in four towns, 2002-2006, thousand people

| Town | Population size by the end of 2002 | Change of population size during 2003-2006 | | | Population size to the end of 2006 |
|---------------|------------------------------------|--|------------------|------------------|------------------------------------|
| | | Total | Natural increase | Migration growth | |
| Gusev | 27,9 | 0.1 | -0.9 | 1.0 | 28.0 |
| Svetly | 22,0 | -0.05 | -0.7 | 0.65 | 21.9 |
| Sovietsk | 43,9 | -1.1 | -2.0 | 0.9 | 42.7 |
| Chernyakhovsk | 43,2 | -2.1 | -1.6 | -0.5 | 41.1 |

Source: *Emelianova/Fedorov (2008)*

Based on the official data of the 'Territorial Body of Federal Service of State Statistics' in the Kaliningrad region some calculations have been made to prospect the future demographic development of these towns by taking into account age-specific death and birth rates on the one hand, but neglecting migrations on the other. According to such a prognosis regarding the active-working age, the following numbers could be calculated for the years 2012, 2017 and 2022 (cf. table 9).

Table 9: Prognosis of population dynamics in active-working age 2007-2022 (in 1,000 people)

| | Gusev | | | Svetly | | | Sovietsk | | | Chernyakhovsk | | |
|--------------|-------|------|------|--------|------|------|----------|------|------|---------------|------|------|
| | total | m | f | total | m | f | total | m | f | total | m | f |
| 2007 | 18,3 | 9,5 | 8,8 | 13,8 | 7,0 | 6,8 | 27,0 | 13,4 | 13,6 | 26,6 | 13,8 | 12,8 |
| 2012 | 16,8 | 8,9 | 7,9 | 12,9 | 6,6 | 6,3 | 25,1 | 12,5 | 12,6 | 24,5 | 12,8 | 11,7 |
| 2017 | 15,3 | 8,1 | 7,2 | 11,8 | 6,0 | 5,8 | 22,7 | 11,3 | 11,4 | 21,8 | 11,4 | 10,4 |
| 2022 | 14,3 | 7,4 | 6,9 | 10,9 | 5,5 | 5,4 | 21,1 | 10,3 | 10,8 | 20,4 | 10,5 | 9,9 |
| in % to 2007 | | | | | | | | | | | | |
| 2007 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 2012 | 91,9 | 93,3 | 90,3 | 92,9 | 93,0 | 92,7 | 92,9 | 93,4 | 92,4 | 91,9 | 92,6 | 91,1 |
| 2017 | 83,3 | 84,2 | 82,3 | 85,3 | 85,7 | 84,9 | 84,1 | 84,4 | 83,8 | 82,0 | 82,8 | 81,3 |
| 2022 | 78,0 | 77,6 | 78,5 | 79,0 | 78,6 | 79,5 | 78,0 | 76,6 | 79,3 | 76,6 | 76,0 | 77,3 |

Source: *Emelianova/Fedorov (2008)*

Due to this calculation up to the year 2022, a distinct decrease of population in the active-working age can be expected, which ranges between 21.0 and 23.4%. In the time-span 2007-2012 a mid-annual decrease of population of active-working age in Gusev will amount 300 inhabitants, in Svetly 200, in Sovietsk 380, and finally in Chernyakhovsk 430. In other terms, until 2012, in Gusev there is a need of positive migration balance by about 360, in Sovietsk 500, and in Chernyakhovsk 570 inhabitants per year in order to compensate for these losses. In the following periods, the migration flows have to increase as the shortage of working forces becomes even stronger. In the nearest future, a sustaining of the existent tendency of some growth of fertility and decrease in mortality can be expected, so that consequently the reduction of the labour force needs to be compensated by strong in-migration in order to stabilize the socio-economic development in these exemplary towns. According to the population forecast for the period until 2015 it can be argued that it is only possible to preserve the present labour force population potential if an influx of about 8 to 9,000 labour forces per year can be realised. Additionally, it is claimed that not only

the conditions for a larger influx of labour forces is urgent, but also a bunch of social policies need to be implemented (such as an improvement of housing conditions and the health service as well as material help to young families etc.).

3.2. BSR SMESTOs in the knowledge economy – part 1: national policy approaches

In order to get a deeper understanding of the territorial capital of SMESTOs and their future potentials in the knowledge-economy, in the following some national policy approaches are highlighted that focus on to activate the knowledge-based development potentials in the cities and towns in the BSR. Short concluding summaries are provided at the beginning of each sub-chapter.

3.2.1. The Nordic Countries

In all Nordic Countries, there is an ongoing political debate about the improvement of the tertiary education and public research facilities. Especially the universities are in the centre of different policies. Their performance shall be improved through merging, i.e. by reducing the number of such higher education institutions. At the same time it is claimed that their focus should be stronger directed towards applied Research & Development. These processes/plans have got very far in Denmark and Finland, whereas in Sweden and Norway those issues are still under debate. Finland is the only country with current regional innovation programmes that are explicitly targeted at SMESTOs (the so-called Regional Centre programme). It can be described as a territorially based knowledge production initiative. Sweden and Norway are currently adopting milder versions of the Finnish Regional Centre programme, but at a much smaller scale in terms of incentives and funding. Knowledge production policies (education, R&D, innovation policies) display in all Nordic countries a strong sectoral, disciplinarian as well as technological orientation. Territorial or regional objectives are subordinate at best. Most explicitly in Denmark and Finland the focus is on the knowledge production to support economic growth and increased internationalisation of the national economies (perhaps), but neither using these policies as an instrument to develop SMESTOs nor to contribute somehow to territorial cohesion within the country. In Sweden and Norway, however, some slight signs in that direction can be observed.

*Norway*¹⁵

In Norway, various sectors and administrative levels perform the publicly funded support for innovation. At the national level, the many specialised ministries and major cross-sectoral authorities and policy implementation bodies such as the Norwegian Research Council (NRC) and Innovation Norway (IN) proceed their national coordination mandate differently. While Innovation Norway have regional offices in all counties, the Norwegian Research Council is just beginning to establish such a decentralised representation and still remains represented by Innovation Norway in several counties – mainly those without major regional university centres.

Several elite Research and Development and innovation programmes have been initiated particularly to strengthen the knowledge functions of cities and major towns. A set of 13 Centres for Excellence have been initiated for the 2002-2013 period, with an additional, second wave of 8 new Centres of Excellence (CoE) have been identified, which will receive funding for the 2006-2016 period. Each of the Centres of Excellence will receive an annual basic funding from 6 to 20 million NOK from the Norwegian Research Council. All current Centres of Excellence are located at the universities in the main regional centres (Oslo, Bergen, Trondheim, Tromsø), so that one can rather characterise this as a kind of 'deconcentrated concentration', as many other SMESTOs in Norway will not profit from this initiative.

In June 2006, 14 competence centre milieus were identified in Norway in order to stimulate collaboration between research-intensive enterprises, higher education institutions (HEIs). The concept was adopted from similar initiatives in Sweden. These centres (in Norwegian: Sentre for Forskningsdrevet Innovasjon, SFF) will be operative from 2007 up to 2012/2015 and the key institutions are all located in the same regional centres that have been chosen for the Centres of Excellence initiative.

The only elite R&D policy programme that currently benefits SMESTOs is the initiative called 'Norwegian Centres of Expertise' (NCEs). It bases on a joint collaboration between the Norwegian Research Council, Innovation Norway and SIVA, the Industrial Development Corporation of Norway. The objective of the programme is to contribute to an increased value added by promoting industrial clusters with a large growth potential. The 'Norwegian Centres of Expertise' are based on the concept of knowledge dissemination – and dissemination of tacit knowledge in particular – which is boosted by geographical proximity and thus face-to-face contacts between actors. In addition, industrial clusters are assumed to be based on existing, local enterprises. As with the Centres of Excellence and the SFF Centres, the 'Norwegian Centres of Expertise' focus

¹⁵ Abstract bases upon Steinecke (2008a)

at Research and Development intensive entities that are aiming at increased internationalisation of their current activities. All 'Norwegian Centres of Expertise' are initiatives that are fully or in part at least beneficial to the knowledge production in SMESTOs, either isolated ones (such as in Raufoss, Kongsberg) or in regional networks. The ambition is to recruit a total of ten regional centres during the first three-year period (2006-2009). The Norwegian Centres of Expertise's (NCE) enterprises are supported annually with more than 7 million NOK. At their inception in 2006, six regional industrial clusters obtained the 'NCE status'. These were (regional affiliation in brackets): Systems engineering (Kongsberg), Maritime Engineering (Møre and Romsdal), Microsystems/electronics (Horten), Subsea Technology (Hordaland), Instrumentation and mechanical equipments (Trøndelag), and Lightweight Metals (Raufoss).

Established in 2001, the objective of another programme, called Arena, is to contribute to increased innovation and value creation through cooperation between enterprises, higher education institutions (HEIs) and the public sector. This is another product of collaboration between the national authorities Norwegian Research Council, Innovation Norway and the Industrial Development Corporation of Norway (SIVA). The programme intends to develop regional clusters based on a concentration of firms within a business sector and relevant R&D- and other knowledge institutions by strengthening the interaction between these parties. The programme offers financial and knowledge support to the planning and implementation of long-term development projects. The projects being supported so far based on regional networking initiatives and partnerships between the drivers of regional clusters, and have in particular benefited some peripheral regions in the Northern part of Norway and the Southeastern interior. The Arena programme has also been an important model in developing the 'Norwegian Centres of Expertise' (NCE) programme. During the first half of the programming period (2002-2006), the programme initiated 21 projects, which in total received NOK 124 millions for supplementary funding. The main focus of the project has been to establish and strengthening regional networks and the relations between triple helix actors, and by improving their knowledge production capacities. During the programming period, the projects are increasingly taking on a systemic, territorial perspective as well as focussing on particular sectors.

A new Research Council of Norway programme, Policy Measures for Regional Innovation Systems (VRI) established in 2008, aims to create a comprehensive and strengthened research and innovation policy towards regional centres, and to establish closer cooperation between regional research institutes, central government-operated university colleges, and the business sector. The VRI programme shall strengthen

interaction with regional government and other policy players. Activities are taking place in close cooperation with Innovation Norway and with the programmes Arena and NCE programmes, as well as related policy measures within the Industrial Development Corporation of Norway.

Sweden¹⁶

Various state agencies are responsible for implementation innovation policies at the national level. In the government, state agencies have a traditionally strong position in policy implementation while the ministries are more weakly positioned, at the regional level the County Administrative Boards are important actors. The Swedish Governmental Agency for Innovation Systems (Vinnova) is to promote sustainable growth by financing Research and Development and developing effective innovation systems. Vinnovas particular area of responsibility is the link between innovations and research and development activities. Nutek, the Swedish Agency for Economic and Regional Growth, is responsible for developing entrepreneurship and growth in enterprises. Its task is also to support the business sector with information, advice, corporate financing, improved conditions for starting new enterprises as well as the internationalisation of the tourist industry. In addition, the IDC (Industrial Development Centre) network can be described as something of a 'missing link', which will enable co-operation between enterprises and other important actors at the regional level. Additionally, various programmes have been introduced to boost the potential for regional innovation systems (RIS).

The VINN Centres of Excellence programme aims to strengthen research and innovation environments. Managed by Vinnova, the objective of this programme is to develop universities as research resources for industry and the public sector by creating strong and internationally attractive environments that offer scientific excellence, growth and benefits for all the actors involved.

The Vinnväxt programme (Regional Growth through Dynamic Innovation Systems), was initiated in 2002 and is also managed by Vinnova. Its objective is to promote growth and international competitiveness within the functional growth areas through problem-oriented research and development of innovation systems to internationally competitive levels. The Vinnväxt programme has a more direct focus on regional innovations and clustering. The programme is to promote sustainable growth in the regions based on internationally competitive ability, by successively developing or

¹⁶ Abstract bases upon Steinecke (2008b)

further developing the functioning, dynamics and effectiveness of innovation systems within functional regions (!). About 70 initiatives have sought financing in two rounds of calls (2003-2004), and eight regions have been awarded for funding. The eight regions have had a common strategic idea (vision) within the region, a strong research and innovation environment, a strong regional leadership and active cooperation between research, the business community and public sector agents. Vinnväxt regions are funded with up to 10 million SEK annually for a period of up to 10 years. Vinnväxt initiatives are currently in operation in Luleå/Umeå (Process IT Innovations), Gothenburg (Biomedical), Borlänge (Triple Steelix), Hudiksvall region (Fibre Optic Valley), Linköping/Norrköping (Health instrumentation), Scania (Cross-border innovations), Mälardal valley (Robotics), and Uppsala (Uppsala Bio).

The Institute Centres of Excellence programme objective is to strengthen research and innovation environments in R&D institutions. The idea behind this programme, led by VINNOVA, is that the research institutes complement the collaboration between industry and research programmes at universities and colleges. The R&D institute sector represents an important resource, not least for Small and mediums sized economies that need external competence in order grow. Finally, Innovationsbron AB is an incubator programme that is managed by Vinnova as well. This programme aims at creating and strengthening the environments for new knowledge-intensive companies, so-called incubators that are linked to Sweden's universities.

In 2002, the Swedish government commissioned Nutek, Vinnova and ISA (Invest in Sweden Agency) to prepare a joint program for the development of innovation systems and clusters. The program supported 30 cluster initiatives. Several analyses were conducted, with the aim of building knowledge and finding tools for business development. The joint programme ended in 2005 and Nutek is now carrying out a new regional cluster programme until the end of 2010.

Finland¹⁷

The collaboration between the main bodies to implement innovation policies is about to be improved. The main players are the Academy of Finland, responsible for the national funding of basic research, SITRA, which is a funding authority increasingly focussing on research programmes, and finally VTT, which is a large R&D research institute with some 2500 employees.

¹⁷ Abstract bases upon Steinecke (2008c)

As a part of its 2007-2011 programme, the government has announced that it will support the establishment of Strategic Centres of Excellence. A Centres of Expertise programme (based on cluster networks) will be set up to strengthen the innovation base in the regions and promote collaboration between regional key players. Already, an important team of players in the field of regional innovations are university cities, such as Helsinki and its surrounding municipalities and Tampere, Oulu and Turku. They form the core of actors in high-tech research clusters – and thus not any smaller peripheral city in Finland. Many of them compete on the international level with similar sized or profiled cities, which means that strategic planning in relation to innovation policy has become a very important task for these cities. Apparently, in Finland there is a strong interest in promoting sectoral industrial policies. The Finnish Science and Research Council (VTR) have recently taken the initiative to improve and strengthen further economic sectors that traditionally have been strong in Finland (namely forestry, metallurgy and ICT/telecommunications).

The policy programmes with the most important impact in terms of developing the territorial innovation potential of Finnish regions are, however, the Centre of Expertise and the Regional Centre programmes. The Centre of Expertise (CoE) programme was initiated in 1994 and based on 'triple helix approaches'. The triple helix approach denotes the university-industry-government relationship as one of relatively equal, yet interdependent, institutional spheres that captures multiple reciprocal relationships at different points in the process of innovation and knowledge capitalization (Etzkowitz 2002). Based on collaborative public-private projects, the objectives of the programme were initially to create jobs, prevent job loss, create companies, develop innovations, and train people in selected knowledge-based sectors. In the current phase of the Centre of Expertise programme (2007-2013), the concept has evolved into a region-based tool serving business-driven clusters consisting of actors situated in different regions. A regional viewpoint was considered insufficient after the first phase of the Centre of Expertise programme. Instead, policies and tools have been required to create networks between actors that are linked within the same cluster in different regions.

From the outset, the Centre of Expertise programme could be understood as a part of the Finnish urban innovation policy. Although it is a regional programme, it is consistent with a more general, systemic approach to promote the triple helix of collaboration. Originally an urban policy initiative, it has been gradually expanded to include smaller urban centres to serve as regional hubs in collaboration networks. The Centres of Expertises have had a central role in developing regional innovation policies: experimenting with new ways to fund operations and engaging more SME's in projects

have been central for this success. The Centre of Expertise programme combines different sector policies (regional development, innovation, education, labour force training) in a bottom-up policy framework. They frequently use science parks as operational platforms, albeit in much wider territorial areas than are customary, with cluster actors located across entire city/urban regions or regional councils. The Centres of Expertises remain a strategic element of national policies to enhance the economic role of small and medium-sized towns as nodes in regional production systems.

Using the Centre of Expertise programme as a model, the Regional Centres Programme (RC) was launched in 2001 with the goal of developing small medium-sized hubs as a source of competitiveness for regions. The centres were less business-focussed and more infrastructure-oriented than the Centre of Expertise programme. The demand for the Regional Centre programme came after the Centre of Expertise programme had been implemented for a few years. Whilst the goal of the Centre of Expertise programme has been (partly) to develop larger city-regions towards more creative and innovative entities on an international level, regional medium-sized and smaller centres, and the more peripheral areas around these centres, were seen as losers in the implementation of Finnish regional policy. That is also a part of the reasoning why the Regional Centres Programme (RC) programme was set up. The RC Programme is a governmental special programme in accordance with the Regional Development Act. It is founded on the Programme of Prime Minister Paavo Lipponen's second Government, guidelines of regional policy, and the regional policy target programmes of the government.

The aim of the Regional Centre Programme is the development of a network of regional centres covering every region/province, based on the particular strengths, expertise and specialisation of urban regions of various sizes. Regional development based on a network of regional centres results in a more balanced regional structure in Finland and an enhanced international competitiveness. In the future, the resources of national regional policy are meant to be expressly directed to regional centres, and to the enhancement of the network consisting of them. The Regional Centre Programme is being implemented in 35 regions. The RC programme budget 2001-2003 was € 10 million per year, whereas the programme budget was doubled to € 20 million per year for the time-span 2004 to 2006. The second RC programme period continues from 2007 until the end of 2010.

The geographical focus of the RC programme has been widened in the 2007-2010 programme period, since previous Centre of Expertise programme centres have been annexed to the programme. In the case of these 'downgraded' Centres of Expertise,

the source of national funding for innovation promotion will also change, as similar innovation projects in the centres will be promoted through the Regional Centre programme. In this way, all Finnish regional centres and their functional areas of influence will have a direct link to innovation policy.

Denmark¹⁸

The urban landscape of Denmark has seen major economic changes in the past 10 to 15 years. On the one hand, there has been a concentration of economic growth in the larger urban agglomerations; especially in the Greater Copenhagen Area as well as Aarhus and the Triangle region (all in all eight SMESTOs are involved in this collaboration, namely Børkop, Fredericia, Kolding, Lunderskov, Middelfart, Vamdrup, Vejen and Vejle) have gained jobs. The peripheries in particular have experienced job loss and general economic downturn. On the other hand, the urban landscapes have expanded into the urban hinterlands producing new economic geographies at the urban fringes.

The overarching policy determining the evolution of the cities' and towns' knowledge functions at the national level is that laid out in the so-called 'Globalisation Strategy', which was introduced in 2006. The Globalisation Strategy has been developed in order to better respond to the national challenges related to economic growth, welfare and innovation. It was initiated by the Danish Prime Minister Fogh Rasmussen in early 2005. A ministerial task force is responsible of implementing the strategy. It is assisted by a coordination forum – the national globalisation council – consisting of some 26 academic and administrative professionals. The horizon of the work of the globalisation council has been set at 10 to 20 years. The Danish globalisation strategy focuses explicitly on improving the pre-conditions for education (in general), Research and Development as well as for entrepreneurship.

A range of policy initiatives have been introduced recently. Their impacts may have effects on the knowledge production potentials of Danish SMESTOs in the long term. The universities shall focus stronger on top-class Research and Development, and the distribution of funds will be more determined by the universities' ability to cooperate with the business sector and the third sector. The business sector shall be stimulated to increase Research and Development and innovation, mainly by improving the framework conditions. Increased focus will be put on internationalisation and efforts to strengthen entrepreneurial cultures.

¹⁸ Abstract bases upon Steinecke (2008d)

In order to implement these policies, Danish central administration has been reorganised both nationally and regionally. All ministries are responsible for implementing the globalisation strategy in parts. In all ministries, new globalisation units have been established to follow up on the strategy. A new globalisation coordination office has been introduced in the Ministry of Finance. All political parties in the Danish Parliament have agreed on the funding of the implementation process for the 2007-2012 period, which is at total about 39 million DKR. 60% of these funds will go to Research and Development and innovation activities, while 40% will be spent on improving the educational sector. The organisation of innovation policy initiatives based on the Globalisation Strategy consists of several bodies. The universities receive about half of all public Research and Development funds. Independent Research and Development funding is provided by one of several different research councils: The Danish Research Foundation of Basic Research funds some 30 Centres of Excellence (CoE), which have been introduced gradually from 1997-1998. The most recent Danish CoE's were founded in late 2007. All CoEs are currently affiliated with universities.

An explicit regional approach, however, is insofar lacking in the globalisation strategy, not only in reforming the educational system (as for instance by reducing the number of universities – which can be taken as a centralisation move). However, some regional differences have been taken into account concerning national innovation policies in Denmark. In particular, several initiatives have been introduced to strengthen R&D and innovation initiatives in regions with relatively low economic activity rates. The action plan 'Knowledge moves out' from 2004 has direct regional implications for businesses in the periphery. The aim of the actions defined in the plan has been to strengthen research and innovation in regions with relatively low activity rates. The four priorities were: research, technology and innovation has to be put on the regional agenda; a strong regional co-operation regarding research and innovation; a regional competence lift, and more entrepreneurs in the whole country.

At the regional level, six permanent Regional Growth Fora (in the regions Nordjylland, Midtjylland, Syddanmark, Hovedstaden, Sjælland and Bornholm) were established in April 2006. They shall contribute to maintaining a regional approach to globalisation. The main idea of these is to coordinate all central forces in a region in order to create a development strategy for the region, by implementing regional development plans. On presenting the priorities of the projects funded by the various Regional Growth Foras in 2007, cluster initiatives were particularly prevalent in the Foras serving the western part of the country - Jutland (Southern Denmark and North Jutland). These are combined innovation, entrepreneurship and education projects, which might have particular impact on local or regional SMESTOs. In addition to cluster initiatives,

regional growth for a projects focus on education, entrepreneurship, innovation and tourism initiatives.

The action plan has also resulted in the establishment of regional technology centres. They aim at strengthening the regional interplay for research and innovation and ensure an efficient knowledge transfer between the science institutions and companies located in non-metropolitan areas in order to stimulate a high technological development in these regions. The plan provides support for a set of Regional Technology Centres (RTC) from 2006 up to a maximum of 4 years. Currently 14 RTCs are in operation. All of them are headquartered in smaller town or cities such as Esbjerg (Offshore Centre), Kolding (Steel Centre) or Slagelse (Seeds). Each of the RTCs are funded with some 3-4 million DKR annually.

Additionally, the Danish Council for Technology and Innovation has initiated the establishment of four regional ICT 'competence centres'. These centres will actively work for creating and establishing research and development cooperation between companies and ICT-knowledge institutions with a special focus is on regional high performance ICT competences. The ICT centres are located in the urban centres of Aalborg, Aarhus, Odense and Sønderborg. Each of the ICT centres is funded with some 5.75 million DKR annually. Another initiative aims to increase the number of well-educated people employed outside larger urban agglomerations by strengthening the cooperation between small and medium sized companies and science institutions. The measure is offered to small and medium sized enterprises in order to stimulate employment of high-educated personnel.

3.2.2. The Southern Arc

Not surprisingly, the findings provided by the national experts are quite diverse with regard to Germany, Poland and Belarus compared to the Nordic Countries where a common, somewhat similar tradition and direction in terms of policy approaches is easily noticeable.

In Germany, there is no specific cluster or innovation policy with regard to small and medium-sized cities. However, there is a whole bunch of national as well as regional policies (in the various Länder), which try to foster regional innovative capacities. On the other hand, when reading the partly long established political programmes and documents, one can detect easily a strong awareness of the role and function of SMESTOs outside the larger metropolitan regions. However, as in many other

countries, the metropolitan areas benefit most from globalisation and development towards the knowledge society. Therefore the political discourse in Germany has been recently very much directed to discuss new ways and means how the development of metropolitan regions can be better linked with areas between them and on how new forms of partnership can be established. This includes also small and medium-sized cities and areas in a more remote position (Manz 2008b).

As there are no policy programmes taking care of the innovative and knowledge functions of SMESTOs in Poland, a detailed introduction is not necessary – so that this chapter focuses only on Germany and Belarus. In a nutshell one can say that in Poland the innovation and research policies are sectoral facilitated and take care of the knowledge functions of metropolitan regions and even not all of them. The new proposals try to strengthen the role of national knowledge institutions, which are to be created in the biggest academic and research centres, like Warsaw, Kraków, Poznań. According to this idea, the regional universities should be taken over by the regional self-governments and financially disabled. They should rather concentrate on teaching than on research, which would in return minimise any further knowledge-based spin-offs between the universities and the local and regional economy there. The regional ambitions are unsurprisingly quite different, but one can say that most of the regional policies focus specifically on the larger urban agglomerations. As a consequence of this, in some Polish regional capitals such as Opole, Olsztyn, Kielce, Gorzów Wielkopolski and Zielona Góra a number of (technical) universities have been created in the last 10 to 20 years. The research potential of these universities, however, is (with a few exceptions) comparatively low (Dutkowski 2008b).

In Belarus, a number of policy plans and programmes have been recently introduced in order to help to stabilise the functioning of the national urban system. Here not necessarily knowledge-based functions and the innovative capacity are in the centre, rather to guarantee a certain level of living standards throughout the country and to secure the provision of services for the inhabitants as well as for industrial and other business activities.

Germany¹⁹

Analysing knowledge based cluster policies for German small and medium-sized cities makes us encounter three major problems. First, there is no specific policy addressed to small and medium-sized cities as such and second, policies fostering the

¹⁹ Abstract bases upon Manz (2008b)

development of clusters may be different according to the level of examination. Finally, cluster policies may be found in a wide range of fields: Economy, Education and Research question the promotion of (technical) innovation and development. As there is no specific cluster policy for small and medium sized cities, it will be necessary to examine the general framework for the development of regional clusters. In other words, how are clusters promoted by the Federation and the Länder and what is said about their localisation?

In Germany, Spatial Planning does not have any powerful instruments to push measures with a strong territorial impact. It is rather of coordinating nature to negotiate between different sectoral policy fields such as transport, environment, but also different kinds of regional economic policies. With regards to the national function of SMESTOs, one needs to mention that the principle of equality and territorial cohesion is one of the top priorities with regard to spatial planning, economic and scientific development. The Federal Planning Act underlines, in line with the Basic Law the notion of equality and of similar living standards in all regions throughout the country. Here one has to mention the basic pillar of German spatial planning, the concept of central places, which shall help to establish a system of functioning cities. Social infrastructure facilities shall be concentrated primarily in central places. At the same time, central places within rural areas shall be supported in their function as anchors of regional development. At the Länder level, the legal foundation is the State Development Plan, which picks up and concretise the concept of the promotion of central places. Mecklenburg-Vorpommern underlines in its State Development Plan the role of central places saying that they shall be fostered as locations for universities and research institutions. Brandenburg also stretches the importance of central places in their role as top communication centres and instructs them to cover the demand for highly specialised institutions within the territory.

Spatial visions at the national level (Leitbilder) react on challenges and establish a framework of common goals, concepts and principles for future spatial planning. Those spatial visions are elaborated by the Federal Office for Building and Regional Planning (BBR) and agreed by the Standing Conference of Federal and State (Länder) Ministers responsible for Spatial Planning (MKRO). In each of the three concepts of the current vision document (Perspectives of Spatial Development in Germany), elements of a knowledge-based society are mentioned. In particular, metropolitan regions are promoted as territories of knowledge intensive clusters. Another recurrent factor is cooperation. Successful cooperation and networking within metropolitan regions, but also between metropolitan regions, cities, their surrounding regions and peripheral regions is regarded as primordial for regional development. The visionary concept

further envisages that medium sized cities and communities in rural areas are associated with metropolitan regions as they consume their products and offer alternatives to the typical metropolitan area, having potentials in tourism, agriculture, forestry and fisheries. Moreover, rural areas are paid particular attention in conjunction with the principle of an endogenous regional development requiring a regional adjustment policy and an agricultural policy for rural areas.

Hypothetically, no region in Germany is preferred to any other. However, the principle of equality as granted by the German Basic law needs to be permanently followed, reviewed and applied to the specific conditions. In order to promote national and international competitiveness and excellence, central places and notably big cities have been boosted by German policy. In some cases, as illustrated above, the promotion of central cities is explicitly fostered by regional development plans. Cities and their surrounding regions attract more economic and knowledge intensive clusters bringing along a network and information exchange impacting various fields (i.e. economy, sciences, culture, tourism, and administration). The conditions that are seen as absolute essential for the success of cities as locations for knowledge clusters are highly skilled employees, social infrastructures, numerous private investors, big enterprises and the proximity to decisional institutions. However, with regard to the (federal and regional) law and the principles suggested by the visionary concept (see above), it becomes evident that economically weak regions are not left behind, but subject to specific support programs.

In recent years, economic and knowledge intensive cluster policies have been placed on top of the political agenda. In 2006, the ministry of education and research made available a total of about 15 billion Euros by 2010 for a national high-tech strategy. This high-tech strategy has fixed the following priorities: the development of lead markets, the improvement of the cooperation between science and industry and finally, the acceleration of direct applications of findings. It shall further contribute to the goal, which is to invest three percent of the German domestic gross product in research and development as pursued by the Lisbon strategy. Overall, 17 high-tech sectors 15 top clusters will be subject to subsidies policies. Furthermore, within the framework of the Initiative for Excellence, the Federation attempts to strengthen the position of institutions in higher education and research. Between 2006 and 2013, a total of 1.9 billion Euros will be provided in order to promote graduate schools, excellence clusters and top- class research at universities. Until now, nine universities have been labelled as 'elite universities', whereas their location and the size of the city where they are located did not play a role. On other words, compared to former initiatives to

strengthen public Higher education and Research and Development facilities across the country, aspects of to improve territorial cohesion have not been of any importance.

As mentioned above, knowledge based clusters are in the focus of various policy fields. In particular, they may be found in Economy, Education, Research and Development (R&D). Thus they have a social, educational and/or economic dimension. Innovation policy can be initiated by the Federation (1) and/or by the Länder (2) which may be even more important as the educational system is under supervision of the individual state. At the federal level, the responsible ministries are notably the Federal Ministry of Economics and Technology (BMWI) and the Ministry of Education and Research (BMBF). At the Länder level, the main fund providers are the respective ministries. Federal programs are assigned to promote directly one specific short-term project in a concrete field or to support institutions or enterprises as a whole. The support of knowledge and company clusters may be granted by financial means or an innovative knowledge and company-related policy. The Länder either simply implement supra-regional policies (i.e. federal or European) or draw up policies themselves. The content of these policies may be the diffusion of supporting funds or the definition of regional priorities. Overall, Länder policies usually show the same characteristics as federal policies, however, the development of regional potentials and the support of regional networks have top priority. Länder programs thus try to upgrade the regional structure of enterprises and site-related factors (e.g. the programme ProFit for Berlin or TIB for Brandenburg).

Furthermore, there are special programmes for eastern regions. Initiated by the Federal State, they may either represent support programs such as NEMO and InnoWatt (cf. Fig. 29) or have a special focus on eastern regions. Even if the respective programs appeal to every Land, they have not the same criteria for admission and can not possess the same amount of funds or to pay the same interests. Special conditions for eastern regions are, for instance, granted by the ERP Innovation Program and ProInno. The variety of the programs and their targets make it difficult to say which goal they pursue. The innovation programme is designed to foster the specialisation in one specific branch, which might have impacts on the region. These branches can be attached to a specific regional tradition or have been developed in recent years. Examples for main branches and clusters based on these branches are aeronautics (Hamburg) information technology (Bremen), maritime economy, agriculture and tourism (Mecklenburg-Vorpommern), optics and photonics (Brandenburg). The program may also aim at creating a relation between science and industry and thus goes beyond purely market-orientated relations. Thirdly, some programs target on promoting new competence fields or support young business start-ups. With a focus on

industry, these programs may include public-private initiatives and sometimes even require co-financing by a cooperation partner.

Figure 29: Promotion of federal innovation programs in German Länder

| Fostering industrial research | | Network of sciences and economy | | Innovative enterprises, business start-ups. Access to capital market | | |
|--|---|--|-------------------------|---|----------------------------------|-------------------------------------|
| Special program "Promotion of R&D and Innovation in Eastern Germany" | Special R&D Program for East Germany (Inno-Watt) Since 2004 | Promotion of Regional Innovation Networks (InnoRegio) | Entrepreneurial regions | FUTURE | | Since November 2004: ERP-Start Fund |
| | | | | Innovation Management in SMEs in Eastern Germany (InnoMan) | Innovative Regional Growth Cores | |
| Direct promotion of R&D projects (scientific programs) | | Centres for Innovation Competence | Network Management East | tbg Programmes (early stage/Exit) | ERP- Innovation Program | |
| | | Innovation Forums | | Start-up Capital for Companies (High-Tech Gründerfonds) | | |
| | | Innovative Networks (InnoNet) | | KfW-Equity Participation fund east (KfW-Beitigungsfonds-Ost) | | |
| | | Centres of Competence and Competence networks Applied Research at Universities of Applied Sciences | | Science-based Start-ups Program (EXIST) | | |
| | | Innovation Competence Program (ProInno and ProInnoII) | | EXIST Seed | | |
| | | Industrial Joint Research (IGF) | | INSTI- Verwertungsaktion (utilization) | | |
| | | Future Technologies for Small and Medium-Sized Enterprises) programme (ZUTECH) | | Verwertungsoffensive (Utilization initiative) | | INSTI Network |
| | | | | INSTI-Network for stimulation of innovation INSTI-Innovation program INSTI Patents for small and medium sized enterprises | | |

Source: based on "Innovationspolitik in den neuen Ländern", p. 38

- Innovation program in Eastern regions only
- Special conditions for Eastern regions

Belarus²⁰

Historically, Belarus has had a well-developed network of urban and rural settlements, comprised of 207 urban and 23,863 rural settlements in 2006, with an average of 115 settlements per 1,000 square kilometres. The rate of urbanisation (i.e. the share of urban population) is 72%. Over 65% of urban dwellers reside in cities with populations of over 100,000, while the share of these cities relative to the total number of urban settlements does not exceed 7%. For various historical and environmental reasons, the rural settlements pattern is fairly atomized, or dominated by small villages. Over two thirds of all rural settlements have populations of less than 100 people, and their proportion is continuously rising. The largest number of small villages with less than

100 residents (83%) is in Vitebsk Oblast in Northern Belarus. Large rural settlements are the most common in Brest and Gomel Oblast, where the proportion of villages with 200 to 1000 residents is 36% and 31% of the total number of villages in each oblast, respectively.

A number of policy plans and programmes have been introduced recently in order to help to stabilise the functioning of the national urban system:

- Program on social-economic development of the Republic of Belarus for 2006-2010;
- Main directions of the state spatial planning policy of the Republic of Belarus until 2010;
- National Plan of Spatial Development up until 2015;
- State program on regions, medium- and small-sized towns development until 2010;
- State program on maintenance and accomplishment of human settlements
- National program on tourism development in the Republic of Belarus for 2006-2010;
- State program on revival and development of rural settlements until 2010.

The strategic sustainable development goal for Belarus is to ensure continuous improvements in the living standards, to promote cultural enrichment and public morality. This goal can not be achieved without upgrading the nation's spatial organization and improving the living environment. As stated in the law 'on Architectural, Urban Planning and Construction Activity in the Republic of Belarus', the National Plan of Spatial Development 2015 is a general spatial development strategy laying out the long-term vision for change in the nation's spatial organisation and its administrative division, based on existing geopolitical conditions, available resources and socio-economic potentials. The objective of the National Plan 2015 is to facilitate change in the spatial organisation of the Republic of Belarus as a tool for promoting sustainable and competitive performance of cities and regions. Enacted in accordance with the Presidential Decree of 12th of January, 2007, the National Plan serves as a basis for the formulation of sectoral and multi-sectoral programs, plans and projects, regional and district-level spatial plans, urban development plans, and other similar documents.

The base unit in the National Spatial Plan is the human settlement and territory within the limits of the administrative district. The characteristics of the living environment are determined by the development context in the administrative district, the state of

²⁰ Abstract bases upon Semenkevich (2008b)

the urban fabric, and quality of spatial planning in the territories and settlements. The national settlement pattern represents a set of core settlements linked together by transport routes, socio-economic economic and cultural ties. Populated areas are classified by significance in the settlement system, size and function: Settlements of European significance, of national significance, of regional significance, and finally, of local significance.

The Belarusian capital, Minsk, ranks as a city of European significance. Cities of national significance are multifunctional regional capitals with populations of 250 – 500 thousand residents. These cities shall be home to large trading outlets, institutions of higher education, specialised healthcare centres, culture and arts facilities, information and analytical centres, etc. Such resources shall include large academic and research centres, formative enterprises with high exporting potential, as well historical and cultural size of global and European significance constituting the national heritage of Belarus. Cities of regional significance shall have well developed industries are administrative centres of their respective districts, with populations of at least 100,000. These cities shall perform the functions of administrative, industrial, socio-cultural and educational centres for nearby settlements and areas. In addition to centres of administrative districts, cities of regional significance shall also include settlements that are important centres of industry, infrastructure, recreation and culture for their respective regions. Settlements of local significance are industrial, agro-industrial, agricultural, tourism or recreation, or farming communities that shall serve as centres of administrative, economic and other support for the nearby rural areas.

Settlements within the 'special status area' are cities of regional or local significance located in radioactively contaminated areas at 1 – 15 curies per km². The development strategy for such settlements emphasise attraction of human and other resources, modernisation of industries, including those relying on local primary inputs, development of high-technology enterprises specialising in disposal and reuse of industrial waste, environmental rehabilitation, social services and development of settlements in clean but underutilised territories. Revisions have been suggested to the administrative status of individual settlements to reflect their changing role in the settlement pattern, as well as their economic potential, demographic trends and available resources.

Small and medium-sized towns are sources and guardians of history, national identity, culture and traditions. They function as so-called 'provincial capitals' of local significance servicing rural settlements. One more role of these towns is to maintain necessary ecological balance. Restraining urbanisation, small and medium-sized towns

and surrounding agricultural areas conjointly shall be considered as 'buffer zones' between large urbanized centres and protected natural areas (national parks and other reservation areas).

According to the State program on regions, medium- and small-sized towns' development until 2010, investments to the fixed capital of medium- and small-sized towns are planned to be made from the national budget (22%), local budgets (12%), finances of enterprises (19%) and bank credits (47%). Within the frame of the programme, it is supposed to provide benefits for the profit tax and other payments to the number of enterprises for 2007-2010. Implementation of the Program will enhance employment and improve the quality of human life regardless of the place of living.

The backbone of the rural settlement pattern are clusters of rural settlements linked with the respective administrative centres and amongst each other by a variety of administrative, economic, socio-cultural and infrastructural ties. The foundation of a future rural settlements system will be provided by collective agricultural farms (so called 'Agrogorodki'). Agrogorodki are improved rural settlements acting as the administrative, economic and organisational core for the industrial and social infrastructure needed to provide amenities and services to the population residing within 15 kilometres of these settlements.

Over the last ten years, a total of 702 rural settlements have ceased to exist in Belarus. The decline in the number of rural settlements is expected to continue until 2015. If successfully implemented, the State Rural Development Programme can help slow down and reverse this trend. The number of small villages is projected to decrease by 270 by 2015. This number will be highest in Mogilev and Vitebsk Oblast. Specific villages expected to have no permanent residents over the period in question are listed in the spatial development plans developed for each administrative district.

3.2.3. Latvia and NW Russia

In the following two very different approaches are briefly introduced. On the one hand, the example of Latvia shows a rather programmatic approach towards territorial cohesion with a strong reference to the political process and funds at EU-level. Obviously there is a strong awareness in the different policy programmes, plans and other documents that spatial planning policies matter to improve the living standards in the entire country, to minimise shrinking regions (in terms of their economic and demographic development) and to optimise the functioning of the national driving force in this respect, that is the Riga metropolitan region. According to the national expert's report (cf. Kule 2008b), however, concrete examples of distinct policy approaches that are directly related to activate and mobilise the innovative potentials in general and in SMESTOs in particular (as partly in the Nordic Countries for instance) are obviously not existing in Latvia.

The example of science towns in NW Russia as a long established instrument for the 'territorial organisation of innovations' is a somewhat concrete example how such policies are being implemented, here in terms of a kind of 'city contest'. In accordance with the national expert's report (cf. Limonov 2008) this traditional instrument has been adapted recently in order to correspond to the ongoing international territorial competition on the one hand and to increase the competition among the cities that are applying for the status to become a 'science town'. With regard to the North-Western part of Russia and the SMESTOs located there, one has to say, that this instrument can not be considered as particularly successful as most of the cities receiving funds for fostering their profile as a science city are located in and around the Moscow metropolitan region. The abstract below points out as well some shortcomings and problems with regard to this renewed policy instrument.

*Latvia*²¹

The Regional Development Law (effective as of 23 April 2002.) defines the objective of regional development to stimulate and ensure balanced and sustainable national development considering the specifics and opportunities of the country as a whole and its separate areas, reducing disparities between various areas, and preserving and facilitating the characteristic natural and heritage features and development potential of each area. The Latvian policies permit to pursue different development models in different areas, and due to its various geographical location, cultural, historical and

²¹ Abstract bases upon Kule (2008b)

economic traditions, they may take full advantage of these features and development potential. It has been recognised in the national policies that the failure in the past to exploit the above potential to full extent has resulted in unfavourable socio-economic disparities between different regions that hamper the competitiveness of the entire country.

For the period 2004-2006 the *Single Programming Document* (Objective 1 Programme) for Latvia and the Latvian Development Plan 2004-2006 that was elaborated by the Latvian authorities in 2003 had three main objectives: fostering competitiveness and employment, developing human resources and developing infrastructure. Five priorities were put forward on the basis of these objectives: Promotion of Territorial Cohesion, Promotion of Enterprises and Innovation, Development of Human Resources and Promotion of Employment and finally Development of Rural Areas and Fisheries and Technical Assistance (whereas the latter will be neglected in the following).

The first priority "Promotion of Territorial Cohesion" was financed by the European Regional Development Funds and supported large-scale infrastructure investments into the public sector. The priority contained four measures: Improvement of Environmental Infrastructure and Tourism, Development of Accessibility and Transport System, Development of Information and Communication Technologies, and Development of Education, Health Care and Social Infrastructure. The second priority "Promotion of Enterprises and Innovation" was also financed by the European Regional Development Fund and was oriented towards entrepreneurship and promotion of science. It supported formation of new enterprises and increasing competitiveness of the existing enterprises by creating a beneficial environment for knowledge based economy. The priority contained five measures: Support to Development of Innovation, Business Infrastructure Development, Enhancing Business Support Measures for Small and Medium Size Enterprises, Access to Finance for Small and Medium Size Enterprises, and Development of Public Research. The third priority "Development of Human Resources and Promotion of Employment" was financed by the European Social Fund and its aim was to improve the quality and competitiveness of Latvia's labour force, lifelong education. The priority contained three measures: Promotion of Employment, Development Education and Continuing Training, and Combating Social Exclusion.

In addition to the four major development priorities for Latvia the Single Programming Document (SPD) outlines four horizontal priorities that should be facilitated with each activity financed by EU Structural Funds, i.e.: Information Society, Sustainable Development and Environmental Protection, Equal Opportunities and Gender Equality, and Territorial Cohesion. Latvia Single Programming Document Objective 1 Programme

2004 – 2006 underlined that, despite of the fact that education level and professional qualifications in Latvia is comparable high, the labour market was not able to supply job opportunities and/or their skill-sets did not match the demands of the market. The Programme recognised that Latvian employees lack of knowledge and skills essential for the development of modern knowledge-based society – ICT, communication and management skills, basic business knowledge, language skills. In order to ensure relevance of the qualifications and adaptability in the fast changing labour market conditions and foster the business start-ups the accessibility to training and re-training was considered as of special importance.

The education and research infrastructure, particularly Research and Development infrastructure in higher education institutions falls well below international standards. In this environment, the short-term potential of technology transfer from Latvia's research institutes to start-up companies is restricted. Latvia's research community has limited capabilities of a recognised international standard and there is little effective transfer to commercial innovation. The Objective 1 Programme admitted that considerable investment and resources are required to transform these research strengths into commercial products/services. The vision for the future development of R&D was defined in the Guidelines for Developing Higher Education, Science and Technology (for year 2002-2010). One of the tasks set up in the document was to increase the role of science in higher education establishments and especially in universities by restructuring the research system. Independent state research institutes performing basic research were integrated into the universities in the period of 2005-2007.

Another measure that foreseen the support for the development of academic and scientific personnel by motivating students to enter the doctoral studies and pursuing post-graduate research in universities and research institutes was implemented in 2005-2008. The Objective 1 Program for Latvia underlined the necessity to promote integrated development of science, technologies and innovation. This task was achieved by facilitating co-operation between scientific organisations, research institutions and manufacturing companies; by creation of an institution to coordinate the innovation system; by the promotion of industry-initiated research projects; by the development of innovation support infrastructure (e.g. technology parks, centres and business start-ups or incubators); and the promotion of innovation and research projects within the EU 6th Framework Programme. Additionally overall spending for Research and Development from the state budget was gradually increased.

In the study on 'the evaluation of the impact of the EU structural funds on regional development in Latvia', it is argued that the Single Programming Document (SPD) has a major role in regional development or development of separate territories of Latvia. The assessment of the structural funds' implementation during programming period 2004-2006 recognises that there is a connection between total committed financing and socio-economic development level in the regions – more developed regions attract more funding. The territorial breakdown of the public financing of the whole Single Programming Document by planning regions (situation on 01.01.2006) is as followed: Rīgas planning region 40%, Kurzemes planning region 19%, Zemgales planning region, 13% Vidzemes planning region 13%, and finally Latgales planning region 11%, which shows a rather unbalanced picture. The Single Programming Document (SPD) is, however, not a targeted national regional policy document, which aims to minimise the regional socio-economic disparities in Latvia. It is rather a tool to promote developments in the entire country. The main National Guidelines for Regional Development (adopted by the national government in 2004) have, however, the objective to foster the territorial cohesion of Latvian regions and the increase of their competitiveness, to ensure equal preconditions for entrepreneurs in the whole country.

The *National Development Plan* (NDP) of Latvia 2007 – 2013 foresees the implementation of a polycentric development model for Latvia that shall help to develop city networks across the country. The National Development Plan is a medium-term strategic planning document approved by the Cabinet of Ministers on 4 July 2006. It determines Latvia's main development directions, which are education and knowledge for economic growth and technological excellence. Thereby three main priorities are emphasised 1) educated and creative personality, 2) technological excellence and flexibility of industries and 3) development of science and research. The National Development Plan underlines that a long-term commitment is needed to support education, science and industry in order to develop a stable intellectual and material basis for a gradual increase in the quality of life in Latvia.

The National Development Plan (NDP) also takes on board the overall objective of regional development that is to promote and ensure a balanced and sustainable national development by taking into consideration the characteristics and potentials of the country as a whole and its separate parts by minimizing negative differences between these parts, as well as by preserving and developing the distinctive features and potentials for development characteristics of the natural and cultural environment of each separate territory. The NDP acknowledges that Latvia is characterised by a mono-centric distribution of the population – there is one powerful centre, Riga, and a wide and evenly distributed network of towns. The plan states that for a long time such

a distribution of population was regarded as an obstacle for regional development. It proposes that the existing network of towns, in addition to the development of one major centre, is essential to ensure the national competitiveness of the international scale, other centres have to be developed to facilitate regional growth and thus to complement each other. Suggested fields for action are: to channel the limited available resources to selected development centres, to develop co-operation networks, and, finally, to support the attraction of highly qualified human resources to regions.

Apparently with regard to support the knowledge and innovative function of cities, the National Development Plan focuses predominantly only on the Riga metropolitan region as it suggests (among other issues) to develop cooperation between entrepreneurs and science institutions, as well as to create a flexibly responsive business environment and to facilitate the development of Riga as a centre of education, science and excellence in Latvia by improving cooperation between relevant national and local institutions, entrepreneurs, NGOs and researchers. The NDP puts, however, very much its emphasis on the creative individuals and not necessarily on the territories (i.e. cities and regions) where they live and work. Here the support for the renewal of the education system and its infrastructures, as well as the modernization of the scientific institutions is highlighted in the NDP. Tasks for the future are thus the improvement of the technological competence and knowledge management skills in companies by supporting measures that boost productivity and the introduction of innovations in manufacturing and service industries, to support new forms of cooperation between industries, services and sciences.

The *National Strategic Reference Framework* of Latvia 2007-2013 (NSRF) is a policy programming document which lays down a common strategy for the obtaining of the EU Structural Funds and Cohesion Fund resources accessible to Latvia as a Convergence objective (Objective 1) for the 2007-2013 period (with a utilisation period till 2015), and provides coordination between the funds and the operational programmes. The NSRF 2007-2013 follows three thematic axes: 1) Development and Efficient Utilization of Human Resources (receives 1.14 billion EUR); 2) Strengthening Competitiveness and Progress towards a Knowledge-based Economy (receives 0.71 billion EUR) and 3) Improvements in Public Services and Infrastructure as a Precondition for Balanced National and Territorial Development (receives 2.67 billion EUR). In this context, the thematic axis 2 'Strengthening Competitiveness and Progress towards a Knowledge-based Economy' should be mention specifically, as the following measures shall be implement: the commercialisation of applied science, the transfer of innovations and technology; formation of new and competitive enterprises; the application of knowledge to increase the competitiveness of enterprises; the

development of creative industries; and the sustainable and efficient use of natural and energy resources. This thematic axis is thus linked also with the other priorities in the NDP (see above). One of several horizontal priorities of the NSFR is dedicated to the issue of 'Balanced territorial development' and thus addresses specifically to reduce disparities between various cities and regions in the country. Centres of national importance shall be complemented by regional, municipal and local development centres in order to safeguard the provision of services.

The National Strategic Reference Framework NSRF 2007-2013 also recognises that there is a wide recognition at the EU and at the national level (by researchers, politicians, sectoral experts etc.) of the important role of cities in strengthening regional competitiveness. The program underlines that the role of cities, as the driving force of regional development, is growing, taking into account the aims set by the EU and Latvia's National Development Plan 2007-2013 to develop competitive knowledge-based economies. In addition, it is recognized both at the EU and national level that the development of cities and other territories is to be promoted on the basis of the principles of integrated territorial development approach that should be ensured at the stages of planning and implementing territorial development priorities. Latvia's National Development Plan 2007-2013 declare that the towns have to become an important development driving force of each region and of all the country, whose potential and the perspective development direction is determined within the spatial planning process of the region, in co-operation with public institutions, local governments, NGO's and the public.

In order to facilitate the overall objective to strengthen Latvia's polycentric development, the European Regional Fund's Action Program 'Infrastructure and Services' (here priority 'Polycentric Development') shall be used. For this priority 85% of the total sum of the project is financed by the European Regional Development (in total 263 million EUR) is available. This priority includes support activities for cities and towns to create functional ties with adjusting areas based on the approach of integrated urban development or that are performing the role of regional centres.

NW Russia²²

In the Russian Federation, one major form of the territorial organization of innovation activities are so-called 'science towns'. Science towns are those areas with high concentration of intellectual and scientific-technical potentials. These towns emerged in

Russia during the socialist time and played a leading role in the development of industries such as aircraft engineering, electric engineering, electronics, atomic power engineering, and military and airspace spheres. Currently, there are 60-70 science towns in the Russian Federation, which cover according to various estimates 2.5 to 3.3 million people. The population in such towns as a rule amounts between 20,000 and 100,000 inhabitants (only three counts around 200,000 inhabitants: Biysk, Dzerzhinsk, Zelenograd).

The attitude towards small towns as centres for science and innovation has always been controversial. On the one hand, these towns certainly are or could become centres of innovation development, on the other hand, many of them have not yet got rid of the global governmental support 'syndrome' existing in the Soviet period, and have poorly adapted to the market conditions, and the necessity of competitive fighting for financial and other resources. Due to these circumstances, in the period of the 1990s, many science towns and research and production facilities located there sank into degradation. In order to correct the situation and to provide a new impulse to develop the scientific profile in such SMESTOs, in 1999, a federal law was adopted 'on the status of a science town in the Russian Federation'. The main formal criteria for granting the status as a science town of the Russian Federation to municipal entities are as follows:

- The costs of fixed assets of the research and production complex should be equal to no less than 50 percent of the cost of all fixed assets, or the volume of research and technical products of the complex in value terms should be equal to no less than 50 percent of the total volume of products of all business units in the territory of a given municipal entity;
- the number of people working for entities of the research and production complex should be no less than 15 percent of the number of all employees.

According to the this law, once a municipal entity is granted the status of a science town, it starts engaging in priority fields of research, scientific and technical, innovation activities, experimental developments, tests, preparation of personnel in compliance with the governmental priority fields of development of science and technology. The development of these priority activities is provided with governmental support. The status of a Russian Federation science town is thus an attractive instrument to claim for additional federal subsidies. The status of a science town is, however, only granted

²² Abstract bases on Limonov (2008)

to a municipality for a certain period (originally it has been for 25 years, now basically for 5 years).

The status of a science town allows those to enhance the innovation trends in science of production. However, to obtain this status involves a complicated bureaucratic procedure. That is why many towns formally belonging to science towns do not submit applications to receive this status once again. Now, the official status of "a Russian Federation science town" has been granted to 12 towns, 7 of which are in the larger Moscow metropolitan region. In the North-West of the Russian Federation there is only one official science town, namely Peterhof, which is located within the St Petersburg metropolitan region. Currently, Sosnovy Bor (Leningrad region) and seven further towns of the Russian Federation are undergoing the procedure to review the necessary documents by the federal authorities.

In general, a set of measures to develop science towns as territories for innovation is a vital part of the formation of the national innovation system. A further development of science towns is foreseen according to the 'Principles of Russian Federation Policy in the field of science and technology development for the period until 2010 and further prospects', which have been approved by the Russian Federation President in 2002. as well as in line with the policy document entitled as "Basic trends of Russian Federation Policy in the field of development of the innovation system for the period until 2010", which have been adopted by the Chairman of the Russian Federation Government in 2005.

Primary Purpose of the program

The major intention of the development of science towns is to, above all, aimed at foster scientific and innovative fields of high priority. A science town can develop one or more such fields. Examples for monoprofile science towns are Koltsovo (biotechnology) and Obolensk (microbiology). Such mono-oriented science towns have several town-forming enterprises engaging in one sphere of research and technical activity. An outstanding example is Zhukovsky, where the largest research, testing and production facilities in the field of aviation are located. The most typical example of a multi-profile science town is Dubna. Apart from the Joint Institute for Nuclear Research, research facilities are in place dealing with airspace, instrument making, and shipbuilding. Korolev, Obninsk, and Reutov belong to the same type of multi-profile science town. Many science towns develop as well, corresponding to the research facilities, an educational profile (such as in Peterhof).

A development program of a multi-profile science town is used for different items such as, here in the case of Obninsk (Kaluga region), to renew the research and production complex, to develop the production sphere, to train the scientific personnel etc. Since 2005, after the law "On the status of a science town in the Russian Federation" was amended, the status has been granted without approving a targeted program for development of a town as a science town. As a consequence the funding is now rather being used to develop the social and innovation infrastructure of the science town at hand. Such a use of the grants is actually rather a general infrastructural support as it hardly reflects the specific state interest in developing the research and production complexes in such science towns.

We can talk about two basic ways of to promote the innovation activity in SMESTO by granting them the status of science towns. Firstly, the official status of a science town strengthens the position of a town in the field of science and technology. This status is expected to considerably increase the attractiveness of a town for further investments and might even allow enhancing innovations beyond the available state subsidies. Secondly, financial support of development of engineering, innovation and social infrastructure promotes the development of SMESTO as centres for innovation. This financing is implied to complement and strengthen direct funding of priority research activities carried out within state programs and state contracts by entities based in science towns.

Based on prospering science towns of Moscow regions, a pilot project is being currently implemented aimed at formation of elements of the national innovation system. However, in general, innovation development does not reach the rates that could be reached if combined resources of science towns were used. Problems of direct financial support on part of the state are as follows: firstly, planned budget funds were not provided in full; secondly, not all science towns could reasonably apply for those funds. For instance, in 2004, about 700 million rubbles were allocated for the whole program to support seven science towns (in average 100 million per town), though in accordance with the approved programs of their development, over 1 billion rubbles was required.

In 2006 the amount of financial support was equal to 825 million rubbles for ten science towns, which is approximately 80 million per town. Thus, the financial support per town has reduced as the number of small towns with the official status of science towns has grown (currently there are 12 of such towns, and 8 more towns are undergoing the approval procedure).

The procedure for awarding a town with the status of a science town gives rise to unfavourable criticism. On the one hand, it is considered to be extremely bureaucratic, ministries and departments are very slow in considering documents for awarding the status. On the other hand, the status can be obtained by a town faster and not quite deservedly under the lobbying pressure of regional or municipal authorities concerned.

We should note that so far there are no clear regulatory mechanisms of interaction with regard to the development of science towns elaborated by authorities of various levels (federal, regional, municipal). Local government authorities have in accordance with the current legislation restricted powers as regards the creation of conditions for scientific and innovation activity in their territory. Issues of the use of federal property, above all, real estate (buildings, land) located in the territory of science towns, for innovation purposes remain unsolved. Meanwhile, participation of both federal centre and the regions could not be limited to the correspondent funding only, but include also transfer into municipal ownership of certain real estate facilities for establishment of innovation centres, technological parks, business hatching and other forms of support of innovation activity.

Also it has been argued that a reduction of the period of the status of a science town from 25 to 5 years makes it doubtful to implement serious infrastructure projects. Federal authorities initiating such reduction thus presume that the creation of an effective system to fund innovation activities should ensure within the shortest possible period commercial benefits, which is by far unrealistic. In connection with this, it is suggested that in science towns, special municipal funds should be established to support innovative activities and arrangements to develop science-intensive products. The size of a fund would be then directly dependent on the intensiveness of the innovative activities in situ, including active support of the local administrations and the involved small and medium science-intensive businesses.

3.3. Concluding discussion: challenges and policy issues

In the following, some basic findings of chapter 3 will be summed up and some basic issues for policy-making and programming are formulated in view of enabling SMESTOs to become the backbone for territorial cohesion and integration across the BSR.

The pattern of losers and winners becomes more diverse

The current trends in the demographic development of the cities in the Baltic Sea Region show a slight overall decline in total BSR population, which is driven by substantial natural losses (fertility rate < mortality rate) that are for the most part outweighing the migration gains. This trend has been widened recently and will continue, and for the most part become stronger in the future. Apart from that, a continuing overall urban growth goes hand in hand with a rural decline, although with contrasting tendencies between the countries. More specifically, we can 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 in and around several BSR metropolitan regions. Additionally, numerous SMESTOs at the fringe of capitals and other urban agglomerations expand their population most rapidly of all cities due to strong in-migration. The majority of SMESTOs are hampered from shrinking processes, specifically those that are to be found in relatively peripheral situations. In other terms, 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. However, the systematic interpretation of population gains as being positive, while population loss would be negative, does not necessarily 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.

Considering some economic indicators, such as the labour market or the regional GDP per capita at PPS, we can still realise sharp contrasts between several BSR cities and regions. In comparison to an earlier study (Hanell/Neubauer 2005), in this respect, one can say that on the one hand the overall picture remains, namely the traditional East-West divide, on the other hand we can observe an ongoing differentiation, i.e. means that the mosaic of well- and less-well performing regions and those which are increasingly catching-up becomes wider and increasingly diverse. Naturally, this

differentiation can be interpreted as a kind of normalisation with regard to the larger cities and metropolitan regions in the BSR as they are following the trends that are to be found elsewhere in Europe. Nevertheless, due to the spatial structure of the BSR, which is – compared to the rest of Europe - impeded by some specific circumstances (such as long distances, isolated border-regions, sub-arctic climate, sparsely populated regions), the BSR needs to formulate a different approach (compared to other European macro-regions) towards territorial cohesion and how to activate the knowledge-based potentials of SMESTOs (see below).

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

In the future, however, the BSR will face a tremendous demographic challenge. Apart from larger areas in the Nordic countries, one can anticipate a general decrease of the overall population that goes hand in hand with a kind of emptying of rather peripheral areas and those that are characterised by somewhat isolated SMESTOs and their rural hinterlands. Stable developments are rather to be expected in the larger metropolitan regions (here very often rather at their fringes than in the cores) – some of them will even increase their 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 in a very few regions by in-migration. 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 working force (i.e. less people in working age) as well as a greying population (i.e. more people in pension age). The shrinking labour force and the question in how far this scarcity might be compensated by in-migration from other countries as well as the question of safeguarding a certain level of provision of public services to the inhabitants and to business activities within 'greying societies' are thus a central burning issues for the future (!). Another challenge is the issue to what extent the shrinking labour force can be balanced out by productivity improvements.

Beyond those clarifications one needs to bear in mind that the BSR, as many other transnational areas, at least in Europe, is in a so-called advanced demographic transformation process. The process is characterised by substantial changes in the level and intensity of the course of basic demographic processes, such as birth rate, mortality, migration, and both 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 eye-catching policy implications at the *marco-scale* are:

- International companies will analyse where they have access to qualified labour before they start any production in the area. Most likely this will be relatively advantageous for the Nordic countries compared to the other BSR areas.
- The relative population decline in the south and east of the Baltic Sea 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 lead to more international investments in these areas, which will in return enhance further the relative importance of the Nordic markets. This might increase their relative political influence over the Baltic Sea region, most likely on 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 shrinking labour force challenges new strategies how to attract corresponding qualified migrants from other countries in order to compensate for these shortcomings on the labour markets.
- To safeguard a certain level of provision of public services and infrastructures to the inhabitants and to the business activities within for the most part 'greying societies' will become a central challenge up to the year 2013 and even beyond.
- The ongoing emptying of rural areas challenge new strategies how to use the existing e.g. cultural, natural resources in the future. In those areas alternative paths have to be defined such as the development and promotion of soft tourism, recreation or nature conservation.
- To enhance the low birth rate in most of the BSR countries in order to contribute to a stable and sustainable reproduction of the BSR population is not necessarily only a national concern. Local and regional services can contribute enormously to e.g. support to combine family and work/education in everyday's life.

The ambition to support knowledge-based economies is not sufficient across the BSR (specifically regarding SMESTOs)

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), we could get an interesting insight about the level of willingness to invest in future oriented activities, which normally do not have a strong impact in the short term, but rather in the long run. Here it has been very eye-catching that for instance the Polish regions as well as all regions in Lithuania do show the same pattern regarding the size of R&D expenditures compared to the Nordic Countries, i.e. some regions enjoy a relative high share (> than 2%, others a bit lesser), even though the GDP per capita is much lower. A much lower ambition of investing in R&D activities can 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 regions, which is partly not necessarily to be ascribed to their larger critical mass. In other terms, SMESTOs are in general and those that are far away from metropolitan regions in a disadvantaged position to get those subsidies.

The overview of national policy approaches and instrument in the BSR with regard to their focus to activate the knowledge-based development potentials in the cities and towns in the BSR have for the most part confirmed this picture, but also provided some further insights in this respect. A bunch of very advanced programmes, based on a long tradition and knowledge in this policy area, are to be found especially in the Nordic Countries, but partly also in Germany as well as in NW Russia. In the other countries that have been studied such distinct policy approaches have not been introduced so far. They are at best rather hidden in general regional economic or even urban policies that shall help cities and regions to catch up with others. On the other hand, in Belarus and in Latvia there is at least a strong awareness concerning the functioning of the national urban system, which needs to be stabilised to guarantee a certain level of living standards throughout the country and to secure the provision of services for the inhabitants as well as for industrial and other business activities.

To sum up one can state that the activation of the knowledge-based potentials needs a substantial back-up across the BSR. Due to the increasing global territorial competition and the specific spatial structure of the BSR the ambitions at the local, regional, but also national and EU-level have to be strengthened to improve the BSR SMESTOs fitness in this respect. A better knowhow transfer has to be established in order to support transnational mutual learning processes.

The role of VASAB and other pan-Baltic organisations is thus to pinpoint the enormous potentials with regard to further territorial cohesion around the Baltic Sea. As claimed in chapter 2.4 already, 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 SMESTOs are correlated with their geographic position are often taken as proof that the development potentials of SMESTOs depend on their integration in a metropolitan region. Rather than looking at these correlations as a constraint on public action, one should however analyse and raise awareness of the processes leading from a geographical position to economic performance in detail. The objective is to determine to what extent these processes are contingent upon some types of actor behaviour that public policies may change. This implies that there are many alternatives to policies improving the connections between these towns and metropolitan areas.

In other terms, 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 SMESTOs and analysed against the success stories of SMESTOs that do achieve high growth in spite of for instance a disadvantaged peripheral location and/or general preconditions that are presumed to be unfavourable. The objective and rationale of such a bottom-up exploration of structural factors of development is to approach the processes leading to the emergence of 'milieux for collective action', and the policies that can promote them. Therefore, the various showcases shall give some deeper insights to that. Their function here is to illustrate some development-paths of a handful of SMESTOs under for the most part completely different circumstances. Successful policies, measures or any other kind of initiatives and incentives might be inspiring for other policy-maker around the BSR (cf. Appendix part 2).

An improved understanding of the SMESTO's potentials is indispensable

Evidence-based planning is a buzz-word of spatial planning nowadays. It is however important to keep in mind that the nature of the evidence is determined by statistical

delimitations and by data availability, which could be also realised in the course of the work of WG 1.

A thorough understanding of the functional profiles, strengths and opportunities to be found in the city or town at hand is needed. Where are potential complementarities and how can they be activated? What are the critical flows of information or talents and their tacit knowledge? In other terms, tailor-made policy recommendations have to be related to evidence-based approaches. Being able to identify tangible effects of cooperation is a prerequisite for the long-term involvement of stakeholder. The construction of an adequate and useful evidence base however presupposes that the stakeholders are actively involved in its elaboration as to the fact that policy design and implementation is not a linear process leading from evidence to action. It is on the contrary a dynamic process in which the actors, territory and networks need to be defined in interaction with each other.

The definition of the relevant territory is critical in this respect: within what boundaries can one expect social, economic and political actors to establish a 'milieu for collective action'? Within what statistical boundaries should one analyse activity profiles and look for development potentials?

The challenges of BSR SMESTOs have to frame territorial discourse in the BSR and in Europe

The perspective of the European Union and its Member States on SMESTOs has changed. 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 SMESTOs 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 SMESTOs, in spite of the above mentioned evolution. 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 territorial capital.

Furthermore, the concern for 'European territorial balance' has been detrimental to the position of SMESTOs in European territorial discourse. 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 SMESTOs' capacity to develop autonomous global connections. Third, the concern for growth maximisation and for convergence of national economic performance figures has reduced the attention paid to the long term potentials of SMESTOs.

The BSR SMESTOs need to communicate more actively on their concrete development opportunities and challenges and their success stories and best practices. The objective is to contribute to build 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 European, transnational, national and regional levels. The LTP, the ongoing discussion on the EU green book on territorial cohesion as well as the EU BSR strategy are central opportunities to facilitate such discourses. Here again VASAB, but also organisations like UBC (Union of the Baltic Cities) are appropriate speaking tubes 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 traditional perspective on European polycentricity, developing counterweights to the *Pentagon* must be rejected. Instead, the BSR needs to 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. The crucial challenge here is 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, in terms of labour force and infrastructure, may indirectly limit growth in the most central parts.

This concerns SMESTOs as well as metropolitan regions. Strategic alliances and labour divisions are needed, also among metropolitan regions as a global city-region, which covers all international functions to a full extent is missing (cf. chapter 2). Here complementary networks in order to make use of synergies among metropolitan

regions as well as among SMESTOs and between the two 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 reflection on how to optimise the cities' functions in a transnational, national and a regional context.

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 to be established as well regarding 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.

Defining the right modes of governance, but how to find it?

The contribution of charismatic persons in 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 sectors. The critical issue is to preserve the respective role of each stakeholder, especially SMESTOs 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 different territorial and substantial logics of actions, interests and rationalities can be negotiated (and finally harmonised). This is a necessary precondition for a balanced development, taking into account not only economic efficiency, but also democratic embeddedness and social and ecological sustainability.

In a territorial perspective, institutions facilitating consensual decision making and trust are also a necessary precondition for alliances between cities and towns at different levels at the urban hierarchy. Such alliances indeed need to establish in order to promote solutions that are beneficial to all involved partners.

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Appendix: UNESCO World Heritages 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, Keskiuomi region | 1994 | 4 | cultural |
| Verla Groundwood and Board Mill | Municipalities of Jaala and Valkeala, Kymenlaakso region | 1996 | 4 | cultural |
| Bronze Age Burial Site of Sarmallahdenmäki | 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 Nærøyfjord | | 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 Zamość | | City and County of Zamość, 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 |
| Białowieża 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 |
|---------------------|--------------|---|------|------------------|

¹ Located between two countries

² Located between 10 countries, 8 in BSR

³ 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>