



NORDREGIO
Nordic Centre for Spatial Development

STATE OF THE NORDIC REGION 2016

Julien Grunfelder, Linus Rispling and Gustaf Norlén (eds.)
NORDREGIO REPORT 2016:1



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Stockholm, Sweden, 2016

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STATE OF THE NORDIC REGION 2016

Preface

Regional development strategies are most effective when informed by a solid understanding of the broader context. As such, it is vital that Nordic planners and policymakers have access to comparative and reliable statistical information. Nordregio's database is a rich source of such information. It covers the whole Nordic Region, providing comparable data on a broad range of indicators at both the municipal and regional level.

This report is the fourteenth volume in the series "Regional Development in the Nordic countries", which, since 1981, has supplied practitioners and policymakers with comprehensive analyses of Nordic Regional development. The report draws on the latest available statistics to present an analysis of demographic changes, labour market trends, education, economic performance, and developments in accessibility and infrastructure. For the first time, the report includes a Regional Potential Index, which highlights the strengths and weaknesses of the 74 Nordic Regions in relation to one another, and identifies the regions with the strongest growth potential.

The themes of the chapters have been selected based on Nordregio's thematic focus areas and the Nordic Cooperation Programme for Regional Policy 2013-16. This edition also takes into account the following European Union 2020 targets: 1. Employment (75% of the 20-64 year-olds to be employed); 2. R&D/Innovation (3% of EU GDP invested in R&D); 3. Climate change and energy (greenhouse gas emissions 20%-30% lower than 1990, 20% of energy from renewables, 20% increase in energy efficiency); 4. Education (rates of early school leaving below 10%, at least 40% of 30-34 year-olds completing third level education).¹

Overall, the Nordic countries are performing extremely well from a pan-European perspective. The average employment rate in 2014 was 73.4 % compared to the EU average of 64.9 %. The Nordic average expenditure in R&D was 4.2% of GDP in 2013, which is well above the EU average of 2 %. All Nordic countries had reached the EU target of 40% of 30-34 year-olds completing third level education by 2014. Today, 38 % of the Nordic Region's energy supply comes from renewable resources, with the largest contribution coming from biomass and waste, hydro and wind power. Alongside these success stories, the report highlights challenges on the horizon for the Nordic countries, including increasing old age dependency rates, high levels of youth unemployment, segregation and social exclusion. Furthermore, large differences prevail between different types of regions (e.g. rural/urban) and also within regions and municipalities.

The State of the Nordic Region 2016 is the result of a fruitful collaboration between researchers, GIS-experts and communications professionals at Nordregio. The editorial team, comprised of Julien Grunfelder, Linus Rispling and Gustaf Norlén, worked in close collaboration with the Nordregio communications team composed by Åsa Ström Hildestrand, Pipsa Salolammi and Linda Randall. Chris Smith was responsible for the final language review and Anna Mattsson for the layout. Thanks to all authors and editors. I would also like to thank Nordic Energy Research for their valuable contribution to the Energy chapter.

Stockholm, February 2016

Kjell Nilsson

Director of Nordregio

¹ http://ec.europa.eu/europe2020/targets/eu-targets/index_en.htm

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Chapter 1

INTRODUCTION

Authors: **Julien Grunfelder**, **Linus Rispling** and **Gustaf Norlén**
 Maps and data: **Linus Rispling**

What is the Nordic Region?

The precise definition of “the Nordic Region” has shifted over time. This report defines the Nordic Region as all municipalities and administrative regions of the five Nordic countries (Denmark, Finland, Iceland, Norway and Sweden), as well as the Faroe Islands and Greenland (both part of the Kingdom of Denmark), and Åland (part of the Republic of Finland). This definition is consistent with that used by the Nordic Council of Ministers. It is important to recognise that there are a number of Nordic territories which are not part of the administrative systems of Nordic countries but still belong to or are administered by these countries. For example, Svalbard in Norway, Christiansø in Denmark and Northeast Greenland National Park (Kalaallit Nunaanni nuna eqqissisimatitaq) in Greenland. Though not strictly included in the national administrative systems, these territories are nonetheless included in the report when data is available.

Among the Nordic countries, Denmark, Finland (including Åland) and Sweden are three out of 28 member states in the economic and political European Union (EU). Iceland and Norway are two out of four members

This report defines the Nordic Region as all municipalities and administrative regions of Denmark, Finland, Iceland, Norway, Sweden, Faroe Island, Greenland and Åland.

There are a number of Nordic territories which are not part of the administrative systems of Nordic countries but still belong to or are administered by these countries.

of EFTA (European Free Trade Association), consisting of countries, which either through EFTA or bilaterally have agreements with EU to participate in EU’s inner market. The Faroe Islands and Greenland are not members of any of these economic cooperation organisations. These differences in supra-national affiliation throughout the Nordic Regions have impact on which data is included in this report. For example, the statistical institution Eurostat provides data for a number of European-wide indicators, but the geographical coverage is limited to EU, EFTA and EU candidate states, thus excluding the Faroe Islands and Greenland. Wherever possible, data for these regions has been supplemented from other sources.

The regional dimension

This report displays data using both regional and municipal administrative divisions (see figure 1.1). As figure 1.1 demonstrates, there are large difference in size of administrative structures within the Nordic Region, both at the regional and the municipal level.

Mapping different administrative levels

In a report such as this one, comparing geographic entities between different countries can be a challenge. The so-called “NUTS” (Nomenclature of Territorial Units for Statistics) and “LAU” (Local Administrative Units) systems are pan-European classifications which classify individual countries’ administrative levels into one common structure. These systems take into consideration population size, and thus facilitate comparisons between similar sized regions and municipalities within European countries. The NUTS levels range from NUTS 0 (national level) to NUTS 3 (smaller regions) and the LAU from LAU 1 (between regional and municipal, except Denmark) to LAU 2 (municipalities, except Denmark). This classification has implications for presenting regional data, as much of the Eurostat statistical data, a main data source for this report, is presented at the NUTS 2 level, i.e. medium-sized regions.

Table 1.1 shows the national administrative structures of the Nordic countries and their relationship to the European boundaries described above. With respect to regions, the spatial units used in Finland (maakunnat or landskap), Norway (fylken) and Sweden (län) are comparable to the European NUTS 3

Region. The standard regional division for Denmark (regioner) corresponds to the larger NUTS 2 regions. For Iceland, the regional division used for statistical purposes nationally (landsvæði), corresponds to the European LAU 1. The thick black frames in table 1.1 represent the “standard” regional division for each country, which is also most commonly used for the maps throughout this report.

The green frames in table 1.1 show the local units which are used to represent municipalities throughout the report. These boundaries differ somewhat from the European context. For example, in the case of the Faroe Islands, the tradition in maps developed by Nordregio, is to use the *sýsla* level, that from a statistical point of view can be translated by region, in our Nordic context as equivalent to municipalities, while the entire territory of the Faroe Islands is presented as equivalent to a region. This is due to the fact that the formal municipality level in the Faroe Islands, *kommuna*, includes 30 units for a total population of less than 50.000, and are thus not comparable to other Nordic municipalities. Similarly, when comparing regions throughout this report, Greenland and Åland are considered as regions on their own.

The average size of a Nordic municipality is 1.065 km². The smallest municipalities are less than 10 km² and are either insular municipalities (i.a. Kvitsøy in Norway and Seltjarnarnes in Iceland) or within greater capital areas (i.e. Sundbyberg near Stockholm, Frederiksberg surrounded by the municipality of Copenhagen and Kautiainen in Finland, surrounded by the municipality of Espoo). The largest municipalities are ca. 20.000 km² and located in Northern Sweden (Kiruna and Jokkmokk). The average population density of a Nordic municipality was around 121 inhabitants per km² in 2015, with densities ranging from under 0,5 inhab./ km² (mostly in remote parts of Iceland, e.g. Fljótsdalshreppur, Árneshreppur), to just under 13.000 inhab./ km² (Frederiksberg, Denmark). Other high density municipalities include Copenhagen (6.900 inhab./ km²), Sundbyberg (5.510 inhab./ km²), Stockholm (4.880 inhab./ km²) and Solna (3.530 inhab./ km²).

The average area of a Nordic Region is 17,548 km². The smallest is Oslo (455 km²), followed by two Icelandic re-

gions, Suðurnes (884 km²) and Hövuðborgarsvæði (1.106 km²). The largest region is Norrbotten in Northern Sweden (106.211 km²), followed by Lappi-Lapland in Northern Finland (just under 100.000 km²). The average population density of a Nordic Region is 65 inhabitants per km² with densities ranging between 1 inhab./ km² (Austurland, Vestfirðir, Norðurland vestra, Norðurland eystra and Suðurland – all in Iceland) and 1.423 inhab./ km² (Oslo region). Other high density regions include Hovedstaden (682 inhab./ km²) and Stockholm (318 inhab./ km²).

Nordic municipal and regional reforms

Patterns of administrative reforms across the Nordic Region have varied in recent years. Denmark and Greenland saw large scale reforms in 2007 and 2009, respectively, but have had no changes in the administrative structure since then. The latest municipal boundary shifts in the Faroe Islands took place in 2009.

Table 1.1: Administrative structures in the Nordic Region in 2015

Nat	NUTS 0	DK	FI	IS	NO	SE	SNUTS 0	FO	GL
Regional	NUTS 1		Manner-Suomi/ Fasta Finland; Ah- venanmaa/ Åland 2			Landsdel 3	SNUTS 1		
	NUTS 2	Region 5	Suuralue; Storområde 5		Landsdel 7	“Riks- område 8	SNUTS 2		
	NUTS 3	Landsdel 11	Maakunta Landskap 19	Hagskýr- slu-svæði 2	Fylke 19	Län 21	SNUTS 3		
Local	LAU 1	Kommune 98		Lands- væði 8	Økonom- isk region 89		SNUTS 4	Sýsla 6	
	LAU 2	Sogn 2174	Kunta; Kommun 317	Sveitar- félög 79	Kommune 428	Kommun 290	SNUTS 5	Kommuna 30	Kommune; Kommune 4

Administrative structures in the Nordic Region in 2015, including number of units, according to the European classification. Black thick frames represent the regional levels presented in most regional maps in this report, comparable from a Nordic perspective, while green frames show the local units represented in the majority of our municipal level maps. The Faroe Islands and Greenland are referred to as “SNUTS” (Similar to NUTS, levels 1-5). Data source: NSI’s, Eurostat, ESPON

Patterns of administrative reforms across the Nordic region have varied in recent years.

In Sweden, several decades have passed since the most recent, large-scale municipal reform, with no municipal mergers at all during the last decade. Finland, Iceland and Norway, however, have seen municipal or regional boundary shifts also in the most recent years, Finland both in 2015 and 2016. Maps and other figures of administrative regions and municipalities in this report are presented according their borders as of 1 January 2015.

The cross-border statistics issue

In the regular register data of Eurostat and National Statistical Institutes (throughout the report abbreviated “NSI’s”), the two prime data sources used for this report, commuters to neighbouring countries are not included. This results in incorrect information (i.e. underestimations) regarding employment (for both day- and night population), incomes and salaries for regions and municipalities located close to national borders, where a substantial share of the population commute for work to the neighbouring country. At the time of publishing of this report, no up-to-date, harmonized Nordic cross-border statistical data was available, other than that produced by some regional authorities, for certain regions and municipalities. Where possible, this data has been used to provide examples of the impact of cross-border commuting (in particular, in the chapters on employment and unemployment).

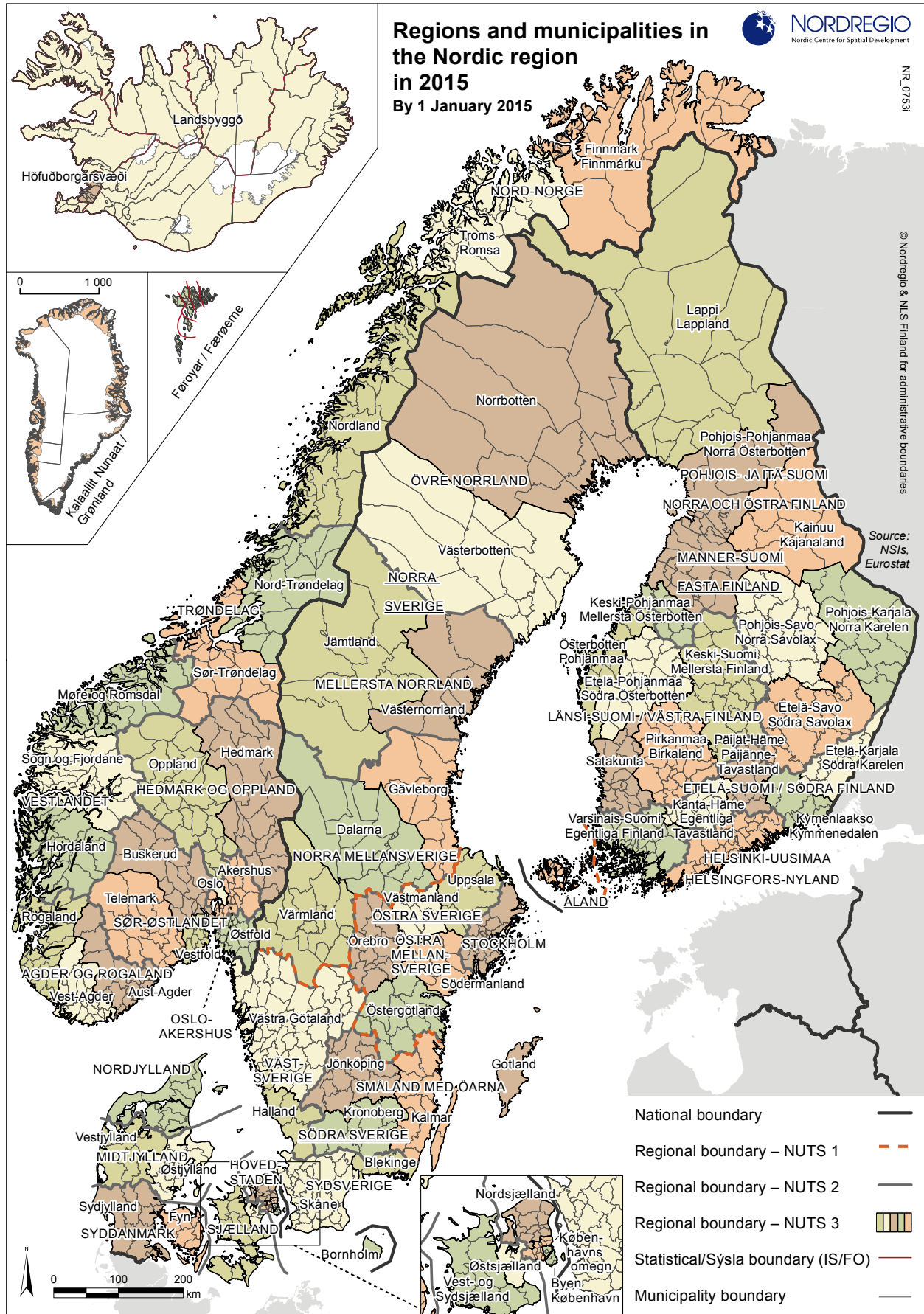


Figure 11: Regions and municipalities in the Nordic Region in 2015. On 1 January 2016, four new Finnish municipalities were created from mergers of previous municipalities, and there was one regional boundary shift in Finland (not indicated in the map).

The structure of the report

The chapter themes reflect Nordregio's focus areas, database activities and existing development patterns as described in the Nordic Cooperation Programme for Regional Policy 2013 – 2016. Each chapter can be read either as an independent article in a particular area of interest or as part of a coherent report. The report covers four themes: Demography, Labour force, Economy, and Infrastructure. Three chapters are dedicated to exploring a key element of each thematic area, using municipal and regional data that has been collected, harmonised and illustrated with maps, graphic illustrations and tables. For the first time, the report concludes with a chapter dedicated to Nordregio's new Regional Potential Index, which highlights the strengths and weaknesses of the 74 Nordic Regions in relation to one another, and identifies the regions with the strongest growth potential.

Chapters 2-4 seek an understanding of the way that demographic changes are currently affecting Nordic societies. Chapter 2 examines overall Population change from a European perspective and at several levels of the Nordic context. It considers the degree to which urbanisation is at play in the Nordic Region based on different ideas about what constitutes an "urban" place. Chapter 3 explores the increasingly important role Migration plays in shaping Nordic populations. It describes net migration and intra-Nordic migration at the national levels, as well as domestic and international net-migration at both regional and municipal levels. Chapter 4 focuses on the way that Changing age and gender structures are putting pressure on regions and municipalities in several types of rural areas.

Chapters 5-7 presents the post crisis picture as reflected in labour force and education statistics. Chapter 5 highlights the strong position of the Nordic countries on Employment when compared to Europe as a whole. It explores employment patterns finding that, despite the Nordics leading by international standards, males still dominate the workforce. It also presents data on commuting, an important aspect of the geography of the labour market. Chapter 6 further explores the labour-force through a focus on Unemployment. It demonstrates that, although again the Nordics look strong in a European context, warning signs are apparent in some regions. Youth unemployment figures in particular raise questions about whether Nordic countries have in-fact made a complete recovery from the financial crisis. Chapter 7 is focused on Education through different stages of the life-course. Although again the Nordic countries fare well in international comparison, the report highlights many regional discrepancies that warrant attention.

Chapters 8-10 deal with other aspects of the economic picture. Chapter 8 on Economic development demonstrates that, although the Nordic economies remain strong, the crisis has left its mark. The chapter explores differences in economic performance between urban and peripheral areas, as well as trade exchange between the Nordic and Baltic Sea countries. Chapter 9 explores developments in Innovation and entrepreneurship with a focus on changes over time, enabling factors in innovation performance, and eco-innovation. Overall, the Nordic countries are performing well on innovation, with Sweden, Denmark and Finland particularly strong. Chapter 10 looks at the regional, macro-economic and sustainability impacts of Tourism on the Nordic Region. It explores the strong performance of Iceland on tourism indicators, and raises questions about how Nordic cooperation might be used to increase the role of tourism as an economic driver in the region as a whole.

Chapters 11-13 are dedicated to the infrastructure that is the foundation for all the activity described above. Chapter 11 explores the factors behind the Nordic Region's leading position on Climate and energy. It demonstrates the importance of a tight Nordic electricity market, enhanced efficiency and security of supply through grid integration, and ambitious, long-term and stable policy frameworks. It also highlights Nordic co-operation as a vital strategy to maintain this position. Chapter 12 suggests that, with property prices dramatically exceeding the EU average in all Nordic countries, demand is outstripping supply in Nordic Housing markets. The chapter also highlights the relatively strong position of rental housing in municipalities in or near the bigger Nordic cities and looks at overcrowding in a European context. Chapter 13 shares insights on Air traffic and air accessibility. It explores the recent increase in passenger numbers, particularly in capital regions, including the potential for continued growth. Further, the chapter stresses the social importance of air accessibility for regions in remote parts of the Nordic Region.

Chapter 14 is dedicated to presenting the results of Nordregio's new Regional Potential Index. The index highlights the strengths and weaknesses of the 74 Nordic Regions in relation to one another, and identifies the regions with the strongest growth potential. The top performer 2015 is Oslo, the Norwegian capital region, closely followed by two other capital regions: Hovedstaden in Denmark and Stockholm in Sweden. Just as interesting, given the focus on potential, are the regions that show the greatest improvement, for example, Troms and Nord-Trøndelag in Norway and Jönköping in Sweden.

Demographic changes: Challenge or opportunity for Nordic societies?

Recent demographic changes in the Nordic Region are consistent with global trends in developed countries. Urbanisation has been a core feature of population increase, with the 30 largest functional urban areas absorbing over 97% of the Region's overall growth over the past 20 years. Migration has been an important source of this growth, accounting for two thirds of the total population increase over the past 25 years. At the same time, rising old age dependency ratios are putting pressure on rural and remote regions and municipalities as younger members of the population drift towards urban and urban adjacent municipalities. Regions are also struggling with gender balance with men outnumbering women everywhere but in urban areas.

These demographic changes pose a challenge to existing social structures and modes of service provision in Nordic countries. Similarly, meeting these challenges with creative approaches to governance, successful strategies to promote social cohesion and positive overall outcomes presents an opportunity for the Nordic countries to demonstrate leadership on the world stage.

Theme 1
**DEMOGRAPHIC
CHANGES**

Chapter 2

URBANISATION:

A core feature of Nordic population growth

Authors: Lukas Smas and Julien Grunfelder
 Maps and data: Julien Grunfelder, Linus Rispling and Lukas Smas

The population of the Nordic countries increased by 7.4% between 2005 and 2015 and has now reached 26.5 million inhabitants. Since 1995, the Nordic population has grown by about 2.6 million people. Population change at the European regional level shows that the population increase has mainly occurred in regions with major urban areas, but the map of population change in the municipalities suggests a more nuanced picture as it also shows the concentration of people in and around urban areas. The population in the 30 largest functional urban areas has grown by 21.5% during the last 25 years or in absolute terms, by more than 2.5 million people. Total population growth outside these functional urban areas has been less than 70 000. In short, over the last twenty years, more than 97% of the population growth in the Nordic Region has occurred within the 30 largest functional urban areas.

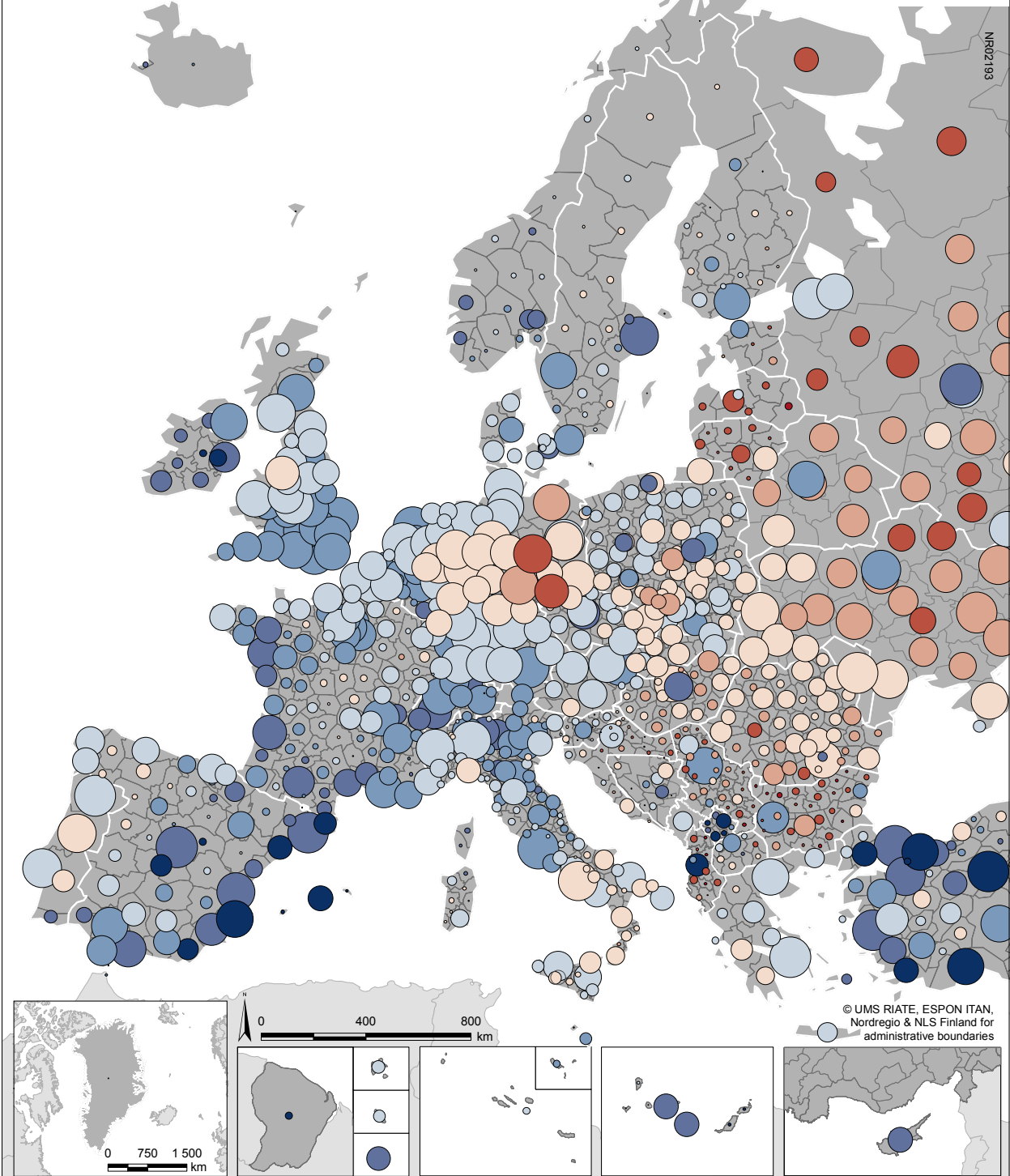
Population changes in European regions

The map of population change in European regions (figure 2.1) shows that the fastest growing regions in Europe with a population increase above 2% between 2000 and 2013 are to be found in Ireland, Spain, Albania, Macedonia and Turkey. There is a clear divide in Europe between east and west, with many regions, especially in the Baltic countries, Russia, Ukraine, Bulgaria and Romania experiencing a population decrease, while population increases are experienced in many other regions (particularly in the more populated regions) in the western part of Europe. This pattern may however already be in the process of dissolving since the map of popula-

Over the last twenty years, more than **97%** of the population growth in the Nordic Region has occurred within the 30 largest functional urban areas.

tion change in European regions 2000-2013 with population size by region (figure 2.1) indicates an east-west belt of regions with population decline in Germany while many smaller regions in, for example, France and Sweden also have declining populations. Furthermore, the Balkan countries display a more diverse pattern with some larger regions growing (see for example Albania and Macedonia) although the largest decreases are also found in Albania (Gjirokastrë and Dibër), Bulgaria (Vidin and Vratsa), Latvia (Latgale), as well as parts of Germany (Suhl and Spree-Neisse).

Total population change in European regions 2000-2013
with population size by region

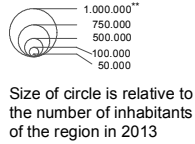


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Annual average population change in Europe 2000-2013, in %
at regional level*

Population increase, %	Population decrease, %
0.0 – 0.5	-0.5 – 0.0
0.5 – 1.0	-1.0 – -0.5
1.0 – 2.0	-2.0 – -1.0
2.0 >	< -2.0

Number of inhabitants in 2013



*) NUTS 2/3 (mix), SNUTS 2. NUTS 2: AT, BE, CH, DE, EL, NL, PT & UK. SNUTS 2: BY, FO, GL, MD, RU, UA
**) 1.000.000+ inh.: decreased circle size for visibility

2000-2013 data, except: IS, Mecklenburg-Vorpommern (DE), MK, RO & UK 2000-2012. AL 2001-2012. BA 2000-2010. HR 2002-2013. MD 2005-2013. RS 2002-2011. TR 2008-2013. XK 2011-2013. Estimates: AL, XK
No data: Brčko District (BA), Republika Srpska (BA) & Transdniestria (MD)

Source: Eurostat, NSIs, Nordregio

Figure 2.1.: Total population change in European regions 2000-2013

Significant growth concentrated in capital and metropolitan regions

In the Nordic Region, the population has increased in the most populated areas of Sweden and Finland decreased in the less populated areas of these two countries (figure 2.2). In Denmark, Iceland and Norway, all regions have had a population increase between 2000 and 2013. The most significant population increases in the Nordic countries have been concentrated in the capital regions, but with a bit less of an increase in Helsinki region than in the others. In Norway the regions of Bergen, Stavanger and Trondheim have also grown by more the 1-2%. The map on population changes in the municipalities in the Nordic countries, between 2005 and 2015, shows that the population increase took place in the more populated municipalities of Denmark, the Faroe Islands, Finland, Iceland, Norway and Sweden, as well as in many coastal municipalities in southern Norway and southern Sweden (figure 2.2). The concentration of

people to urban areas is also evident at this scale as all the largest municipalities have seen an annual average increase between 1 and 2.3%. Even if in relative terms, the largest population increases were in relatively small municipalities in Iceland, western Finland and western Norway such as Kjósarhreppur, Liminka and Rennesøy among others which had annual average population change above 3%.

In absolute terms the urban concentration is even more evident with the most significant population increases occurring in the capital cities and metropolitan regions. The largest population increases for the period 2005-2015 were in the municipalities of Stockholm (+147 000 inhabitants), Oslo (+118 000) and Copenhagen (+78 000) followed by the other largest Nordic municipalities (Helsinki, Göteborg, Malmö, Espoo and Bergen). This population growth in the capital regions and metropolitan areas has not however only occurred in the core municipality but also in the surrounding suburban and peri-urban municipalities. The population increase is in many cases even higher in the surrounding municipi-

City-regions and functional urban areas: elements of definition

City-regions or functional urban areas are usually defined based on three aspects or assumptions (Rodríguez-Pose, 2008). Firstly that there is a (city or urban) core (or cores) surrounded by secondly a (regional or suburban) hinterland, i.e. based on centre-periphery notions. The centre and periphery are, thirdly, connected through some sort of functional links or linkages. In statistical and empirical terms the linkages are often defined in terms of commuter flows, local or regional labour markets or different types of economic activities such as catchment areas.

The OECD uses grid data to identify 'urban cores', which is an urban cluster of more than 50 000 inhabitants and 1500 inhabitants/km², while commuting data is used to demarcate the 'hinterlands' (15% commuting to economic core) but the geographical building block is municipalities (LAU 2). The OECD definition categorises functional urban areas into four classes:

- Small urban areas, with a population of between 50 000 and 200 000
- Medium-sized urban areas, with a population between 200 000 and 500 000
- Metropolitan areas, with a population between 500 000 and 1.5 million
- Large metropolitan areas, with a population above 1.5 million

Iceland is not included in the OECD statistics because it does not produce statistics on inter-municipal commuting. But the Greater Reykjavik area (Höfuðborgarsvæðinu) should be considered as a (approximate) medium-sized urban area with a population of 211 282 (Statistics Iceland, 2015, p. 30). The Greater Reykjavik area includes the following municipalities (population in 2015): Reykjavik (121 822), Kópavogur (33 205), Seltjarnarnes (4 411), Garðabær (14 453), Hafnar örður (27 875), Mosfellsbær (9 300) and Kjósarhreppur (216) (Statistic Iceland, 2015, p 30).

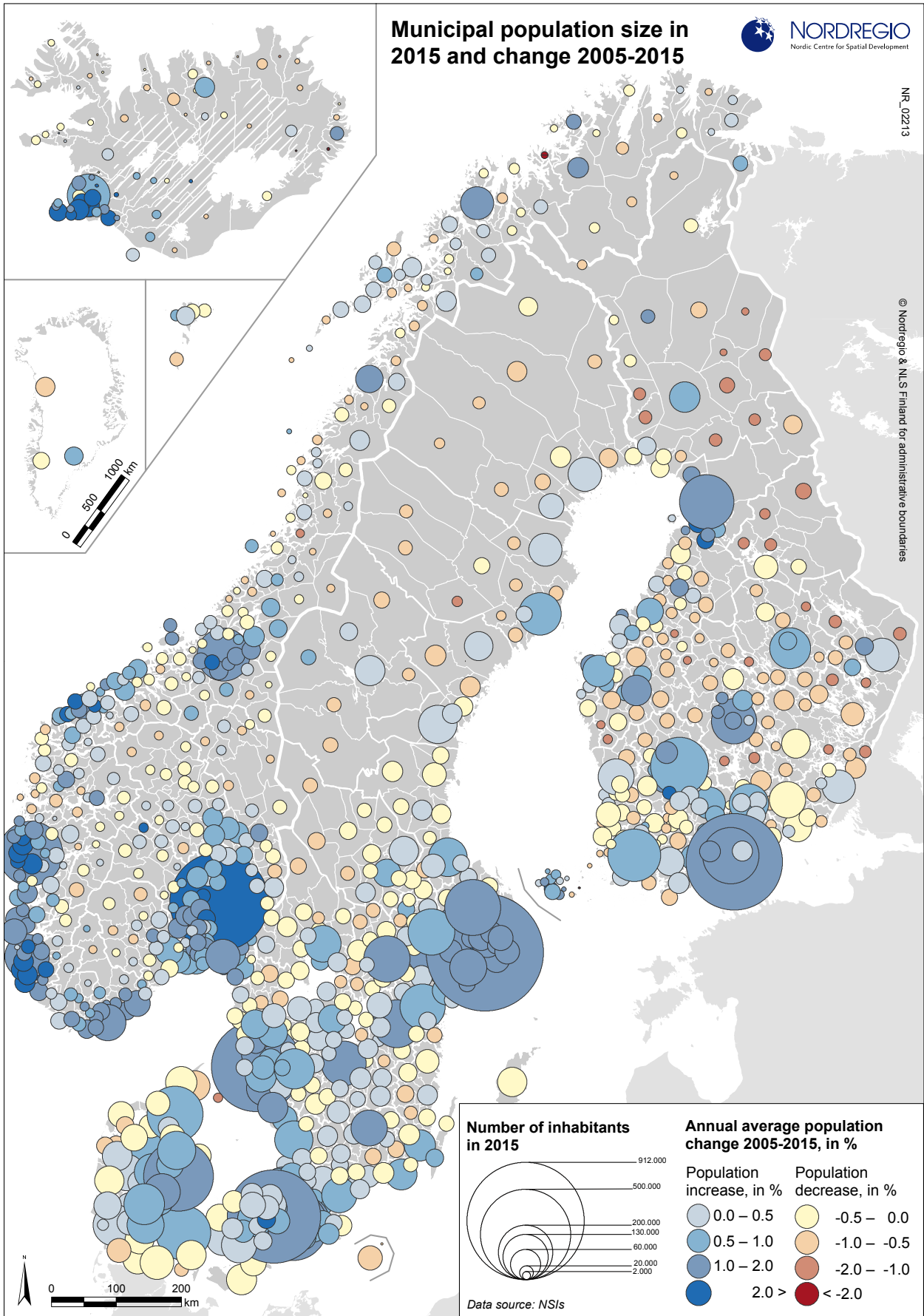


Figure 2.2: Municipal population in 2015 and change 2005-2015

Table 2.1 Population in the Nordic urban areas 1995-2015

	1995	2000	2005	2010	2015	1995-2015 (%)
Stockholm	1724552	1818571	1888246	2035303	2213757	28,4
Copenhagen	1872262	1931883	1968515	2029539	2128512	13,7
Helsinki	1247663	1335763	1396784	1476471	1563429	25,3
Oslo	996857	1057915	1110655	1215615	1332173	33,6
Goteborg	790730	818229	852962	898984	951784	20,4
Malmö	584493	604478	630610	680207	720823	23,3
Aarhus	422434	436749	454197	473349	496131	17,4
Tampere	346873	363047	383151	406293	426609	23,0
Bergen	313669	325990	342935	370091	400512	27,7
Odense	353723	357025	360951	367901	373810	5,7
Turku	286998	301036	310529	319467	333224	16,1
Aalborg	286604	291067	294903	300954	310738	8,4
Stavanger	211975	225960	238651	264243	290054	36,8
Trondheim	193925	202116	213137	232129	250994	29,4
Oulu	182080	197554	216198	233505	250381	37,5
Uppsala	191868	197820	203814	216142	228736	19,2
Reykjavík	156513	171792	184244	200907	211282	35,0
Linköping	179849	179946	184008	191769	199576	11,0
Örebro	172097	175632	179350	186921	196664	14,3
Västerås	172866	172650	177855	182542	191141	10,6
Helsingborg	163807	166029	171595	182319	190597	16,4
Jyväskylä	141294	148500	157790	166569	174353	23,4
Lahti	157127	158101	160730	164794	167302	6,5
Norrköping	144778	142650	144386	148563	154412	6,7
Jönköping	131723	133106	136786	144032	150359	14,1
Umeå	133486	136564	140893	144536	149872	12,3
Kristiansand	109556	115352	120300	128499	138096	26,1
Kuopio	116494	118699	120844	123620	132957	14,1
Borås	96123	96342	98886	102458	107022	11,3
Tromsö	68988	71631	74712	79286	84770	22,9
Total population in FUA	11951406	12452197	12918616	13667008	14520070	21,5
Total population in Norden	23737549	24112131	24551396	25505422	26478386	11,5

Note: The boundaries of the urban areas are in accordance with the OECD's definition (see OECD, 2012), and based in the municipal boards from around 2001, except for Reykjavík where the area of Greater Reykjavík includes the following municipalities: Reykjavík, Kópavogur, Seltjarnarnes, Garðabær, Hafnarörður, Mosfellsbær, Kjósarhreppur (see Statistic Iceland, 2015). The population data comes from Nordregio.

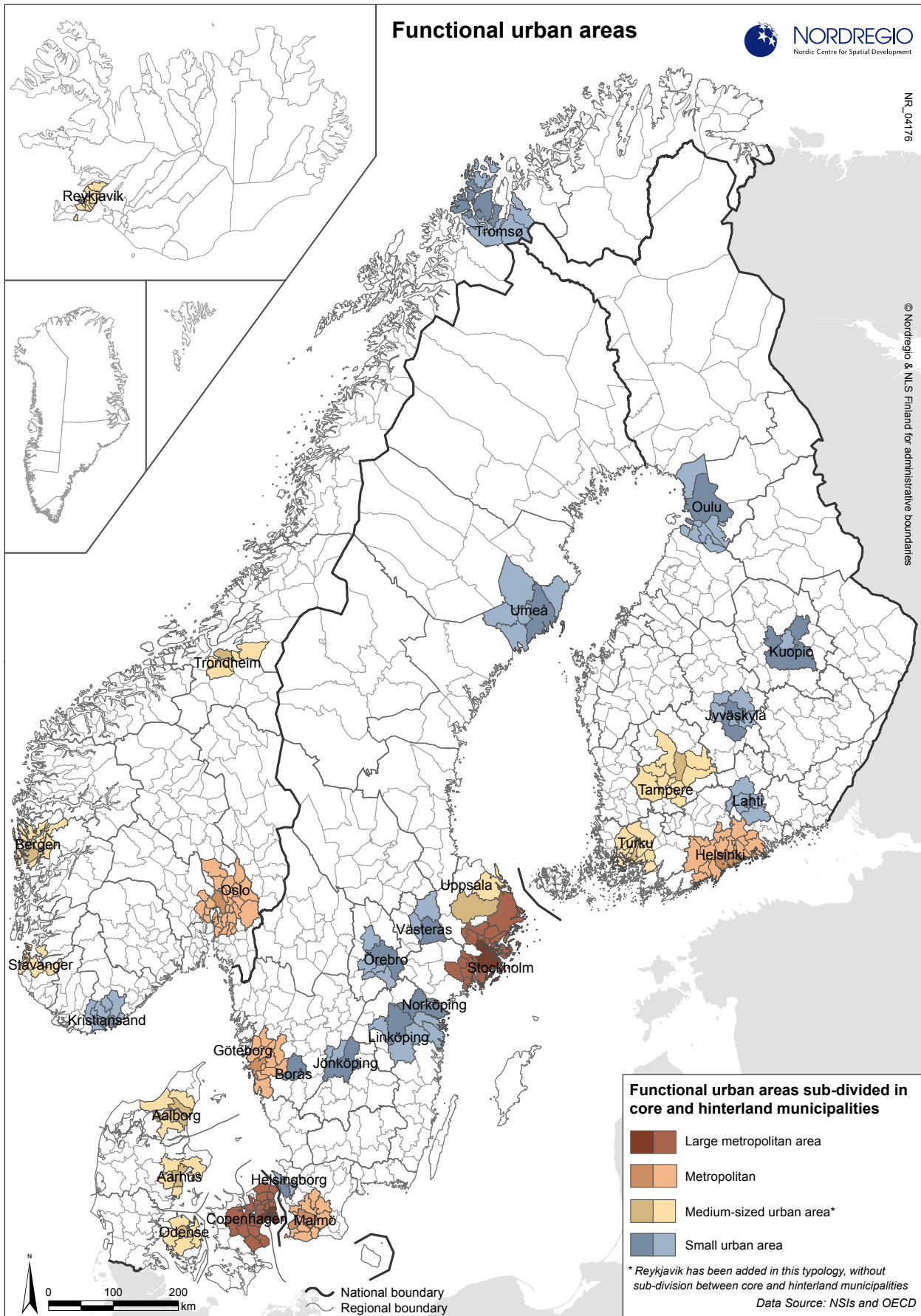


Figure 2.3: Nordic functional urban areas (FUAs). Note: typology based on the OECD definition that includes four types of functional urban areas: small urban areas (50 000 to 200 000 inhabitants), medium-sized urban areas (200 000 to 500 000 inhabitants), metropolitan areas (0.5 to 1.5 million inhabitants) and large metropolitan areas (above 1.5 million inhabitants). Iceland has been added into the OECD typology, where the Greater Reykjavik area is classified as medium-sized urban area (211 282 inhabitants in 2015; Statistics Iceland, 2015, p. 30)

palities, for example, the municipalities of Sundbyberg and Solna adjacent to Stockholm have seen an annual average increase beyond 2.5% while Ås, south of Oslo, has also seen a comparable increase.

Population decrease occurred primarily in municipalities with already small populations and in municipalities located in the inner and northern peripheral parts of the Nordic Region, especially in Finland, the northern parts of Iceland, Norway and Sweden, as well as in Greenland. In relative terms, the municipalities with the largest population decrease are to be found in eastern and northern Finland (Puumala and Hyrynsalmi) and eastern Iceland (Fljótsdalshreppur and Breiðdalshreppur) as well as in insular municipalities in Norway (Loppa), Finland (Sotunga) and Denmark (Læsø) with annual average decreases beyond -1.5%. In absolute terms, the most significant population decreases for the period 2005-2015 were in a number of Danish (i.e. Lolland, Bornholm and Frederikshavn) and Finnish municipalities (i.e. Kouvola, Savonlinna, Jämsä) each of which lost between 2 000 and 6 500 inhabitants. There was however a population increase in the largest municipalities in the sparsely populated areas in the northern part of the Nordic Region (i.e. Luleå in Sweden, Tromsø in Norway, Rovaniemi and Oulu in Finland). This indicates the attractiveness of urban municipalities of regional importance in the sparsely populated parts of the Nordic Region.

**Almost
55%**
**of the population live
in the 30 largest urban
functional areas.**

Urbanisation, urban growth and functional urban areas

Urbanisation is usually defined as the population growth of urban areas in relation to the total population of the country (or the world). It should not be conflated with urban growth which often refers to the physical extension of an urban area or to some general notion of economic growth. Implicit in the term urbanisation is the process of people moving from rural areas to urban areas. As a result conclusions drawn about the degree of urbanisation that is occurring are contingent upon how

Table 2.2. Population of Urban and Rural Areas at Mid-Year (thousands) and Percentage Urban, 2014

Major area, region, country or area	Urban	Rural	Total	Percentage urban
WORLD	3 880 128	3 363 656	7 243 784	53,6
EUROPE	545 382	197 431	742 813	73,4
Denmark	4 935	705	5 640	87,5
Finland	4 577	866	5 443	84,1
Iceland	313	20	333	94,0
Norway	4 084	1 008	5 092	80,2
Sweden	8 251	1 381	9 631	85,7

urban (or rural) areas are defined. In an attempt to re-define the notion of 'urban' the OECD uses grid data to identify 'urban cores', and commuting data to demarcate the 'hinterlands', but the geographical building block is municipalities. The OECD distinguished between four classes of functional urban areas (see box).

If the OECD's definition of functional urban areas is used in the Nordic Region (figure 2.3) almost 55% of the population live in the 30 largest urban functional areas. The population in these areas increased by around 2.5 million from 12 million in 1995 to about 14.5 million in 2015 (table 2.1). Growth varies significantly however between different functional urban areas, from Stockholm (almost 500 000) to Norrköping (10 000). The six metropolitan areas have grown by almost 1.7 million inhabitants. In relative terms, the Greater Reykjavik area and some of the Norwegian urban areas have grown the most, though Stockholm, Malmö and Gothenburg in Sweden and Helsinki and Jyväskylä in Finland have also grown significantly. This is a rather different definition than the one often normally used to show that more people are living in urban areas than in rural areas.

According to the UN more than 80% of the population in the Nordic countries live in urban areas compared with about 75% of the European population and about half of the world's population (see table 2.2.). It is estimated that the percentage of the population residing in urban areas in Sweden and Denmark will be above 90% in 2050 (UN, 2014). Moreover, drilling further down into these figures reveals that they are based on national statistics and that how urban areas are defined differs significantly between different countries (and that these definitions are generally not in accordance with those provided by the OECD). For example, in Sweden, Denmark and Iceland an urban area is a place with more than 200 inhabitants, in Norway however an urban area needs to have a population of at least 2000.

How urban a society is, cannot however be defined only in terms of numbers. Already in 1938, Louis Wirth noted that "the degree to which the contemporary world may be said to be urban is not fully or accurately measured by the proportion of the total population living in cities" (p. 2). In his classical essay with the telling title *Urbanism as a Way of Life* he argues that "the urban mode of life is not confined to cities". If urbanism is considered a social phenomenon and as a way of living perhaps the statement that about 80% of the Nordic population lives under urban conditions may not be so misguided after all. Is not the holiday resort and second home part of an urban way of life? For example, through new technology people living in more sparsely populated (urban) areas can be as connected and integrated into urban ways of living as others, while simultaneously people living in

more densely populated areas can be detached from so-called urban lifestyles though poor accessibility to infrastructure and services.

City-regions: policy potentials and challenges

There is an increased belief that the city-region (as a type of functional urban area) is the most appropriate scale for urban and regional policy and governance in a globalised world (e.g. Rodríguez-Pose, 2008). Various functional city-regions might reflect the everyday travel patterns, regional identities or business networks extending beyond administrative municipal and/or regional (or even national borders). This does however create political and policy dilemmas in a democratic system based on territorial mandates. Furthermore, the regional scale in the Nordic countries does not, historically, hold a strong position in terms of either administrative structures or political loyalties.

It is important to recognise that the size and shape of functional urban areas or functional regions in more general terms is dependent on which function is being considered. There is thus no 'one-size fits all' here, no perfect region utopias. Furthermore, most definitions of city-regions (such as the OECD's definition of functional urban areas) continue to be based on assumptions about core-periphery linkages in a continuous geographical space such as an economic unit, and do not recognise relational spatial networks, for example business networks, or other dimensions such as those in the cultural realm, such as regional identities. In an international perspective the Nordic Region as such might be considered a functional region with the capital cities as core nodes if business locations and networks are considered, but where the so-called 'hinterland' extends all over the world, and where there is also, perhaps, a shared Nordic Regional identity based on their shared history (e.g. Smas & Schmitt, 2015).

Each of the Nordic functional urban areas has grown continuously in population terms over the last 20 years. This has of course had many positive effects but it has also created challenges for these cities and regions particularly in terms of the need to accommodate these new citizens. Developments in Europe and in the world during the autumn of 2015 with refugees seeking asylum in Europe have put further pressure on the Nordic countries and their city-regions. It is however encouraging to note that the larger Nordic city-regions already recognise this challenge. A clear conclusion from joint meetings with municipal and regional authorities in different Nordic city-regions is that social cohesion is recognised simultaneously both as the most vital asset and the most prevalent challenge (Smas, 2015).

Chapter 3

MIGRATION:

An important source of population increase

Authors: Timothy Heleniak, Julien Grunfelder, Lisbeth Greve Harbo
Maps and data: Julien Grunfelder, Timothy Heleniak

The population in the Nordic Region is growing from a combination of both natural increase (more births than deaths) and positive net immigration (more immigrants than emigrants). From 1990 to 2015, the population has grown by 14% and now stands at 26.5 million. Over this period, net immigration has accounted for about two-thirds of total population increase with natural increase accounting for the other one-third.¹

Immigration numbers show a positive increase in population

The Nordic countries and regions can be placed into four groups based on their recent patterns of natural increase and net migration. The first group includes Norway, Sweden, Denmark and Åland, where net immigration has increased considerably and has become the major source of population increase, far exceeding that

Table 3.1: Population change in the Nordic Region, 1990-2015

	Total population		Population change, 1990-2015 (absolute)			Population change, 1990-2015 (percent)		
	1990	2015	Total	Natural increase	Net migration	Total	Natural increase	Net migration
Total	23 226 651	26 478 698	3 252 047	1 255 091	2 040 701	14,0	5,4	8,8
Iceland	253 785	329 100	75 315	63 625	11 536	29,7	25,1	4,5
Norway	4 233 116	5 165 802	932 686	401 573	533 705	22,0	9,5	12,6
Sweden	8 527 036	9 747 355	1 220 319	332 940	888 449	14,3	3,9	10,4
Finland*	4 974 383	5 471 753	497 370	260 348	226 776	10,0	5,2	4,6
Denmark	5 135 000	5 660 000	525 000	176 295	398 583	10,2	3,4	7,8
Greenland	55 558	55 984	426	12 722	-11 691	0,8	22,9	-21,0
Faroe Islands	47 773	48 704	931	7 588	-6 657	1,9	15,9	-13,9
Åland	24 231	28 916	4 685	918	3 548	19,3	3,8	14,6

¹The migration crisis was unfolding during the period in which the report was written: very little can be said definitively at this stage, particularly as the statistics have not yet been released.

of natural increase (Table 3.1). Here migration has accounted for the majority of population growth over the past twenty-five years. Indeed, all together net immigration makes up to three-quarters of the total population increase in Sweden, Denmark and Åland. Greenland and the Faroe Islands form a second group, where the populations have remained relatively constant over the past twenty-five years as natural population increase is levelled out by net emigration. Iceland is in a category by itself where unlike the other Nordic countries it has, since 1960, vacillated between being a country of net emigration and net immigration but has had its own unique pattern of net migration over the past decade (see box). Finland is also in a category by itself where

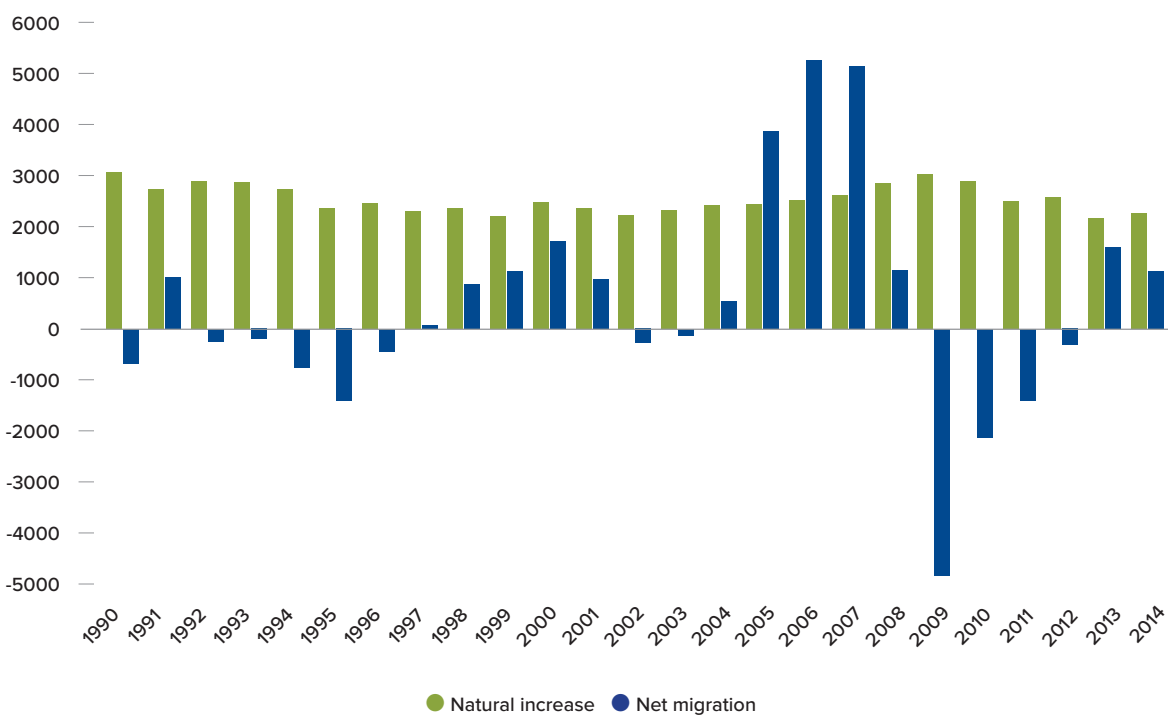
From 1990 to 2015,
the population has
grown by
14%
and now stands at
26.5 million.

Population change in Iceland

In Iceland, during the boom years of 1997-2008 when the economy was expanding rapidly, there was a huge net inflow of 20 266 people. The increase was followed by a net outflow of 5 981 people during the period 2009-2014 due to the banking crisis (figure 3.1). In the 1990s, the volume

of both immigration and emigration increased to nearly 4 000 a year and after 2000 increased even more, to over 6 000 a year. With these fluctuations in net migration, natural increase remains the primary component of population increase in Iceland.

Figure 3.1: Natural increase and net migration in Iceland, 1990 to 2015.



natural increase and net migration contributed to population change to a similar extent for the period 1990-2015.

Migration flows can be broken down into shares of national and foreign citizens. In 2014, the majority of immigrants in the Nordic countries were foreign citizens, averaging 81% of the total. The value varies from 62% in Iceland to 88% in Norway. However, among people migrating away from the Nordic Region, the percent of national citizens is smaller: the share of national citizens comprises the majority in Finland (65%) and Iceland (58%), whereas national citizens comprise a minority of total emigration in 2014 from Denmark (41%), Norway (27%) and Sweden (49%).

Intra-Nordic migration: People flow within the Nordic Region

Migration from one Nordic country or autonomous territory to another is termed 'intra-Nordic migration'. This phenomenon plays an important role in maintaining the coherence of the Nordic Region, and despite

In 2014, the majority of immigrants in the Nordic countries were foreign citizens, averaging 81% of the total.

increased migration from and to countries beyond the Nordic Region, intra-Nordic migration remains a significant part overall migration flows.

The diagram below shows intra-Nordic immigration and emigration for the period 2005-2014. In absolute

Figure 3.2: Intra-Nordic migration 2005-2014

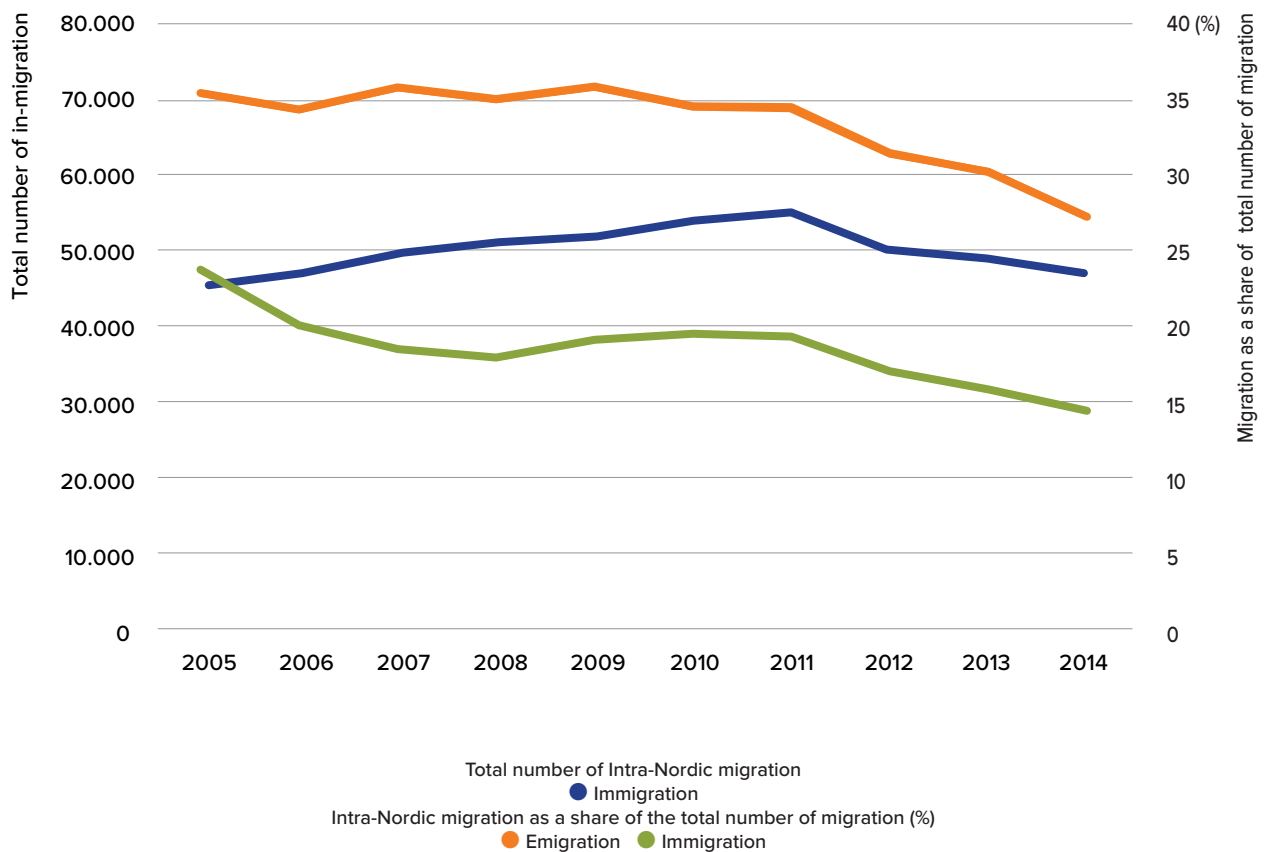
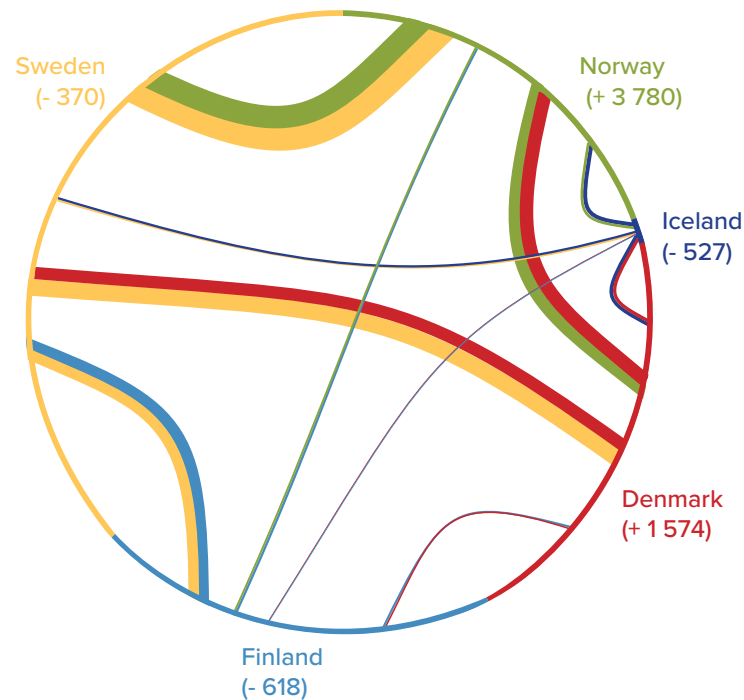


Figure 3.3: Intra-Nordic migration in 2014



Data source: NSI's

Note: each country has an assigned colour, for instance yellow for Sweden, and the colours used for the migration flows correspond to the country of origin of the flow. In other words, all the yellow lines correspond to migration from Sweden to another Nordic country. The length of the arc of the circle is relative to the total population of the country and the number in brackets indicates the net migration value for intra-Nordic migration in 2014.

numbers, intra-Nordic migration peaked in 2011 at 107 000 migration flows between the Nordic countries, or ca 56 000 immigration flows as shown on the diagram (considering that the total flow includes persons that are emigrants from one Nordic country and immigrants into another, the actual number of people moving between the Nordic countries can be approximated by analysing the immigrant group only). From 2012 and onwards, the number of intra-Nordic migrants has been steadily declining to pre-crisis levels (see blue line in the diagram), especially between Norway and Sweden.

In relative terms, the curves highlight the fact that intra-Nordic emigration constitutes a larger share of the total emigration than immigration during this period, reflecting the overall immigration surplus to the Nordic Region. The shares of intra-Nordic immigration and emigration were stable between 2006 and 2011. Again, a change occurred in 2012 when the share of intra-Nordic migration relative to total migration in the Nordic Region started to decline due to the increase in migrations flows from outside the Nordic Region, such as from USA, Syria and Poland, among others. In 2014, figures indicate that intra-Nordic migration had declined to 14% of total immigration and 26% of total emigration.

Denmark and Norway have net Nordic immigration, whereas Finland, Iceland and Sweden have net emigration.

Looking in detail at intra-Nordic migration in 2014 for the five Nordic countries, figures show that Denmark and Norway have net Nordic immigration, whereas Finland, Iceland and Sweden have net emigration. The figure below (figure 3.3) aims to illustrate the migration flows between the five Nordic countries. The largest flows are between Norway and Sweden (about 7.5% of total intra-Nordic migration, in each direction). Norway is the only country with net immigration from all four other Nordic countries. On the other hand, Fin-

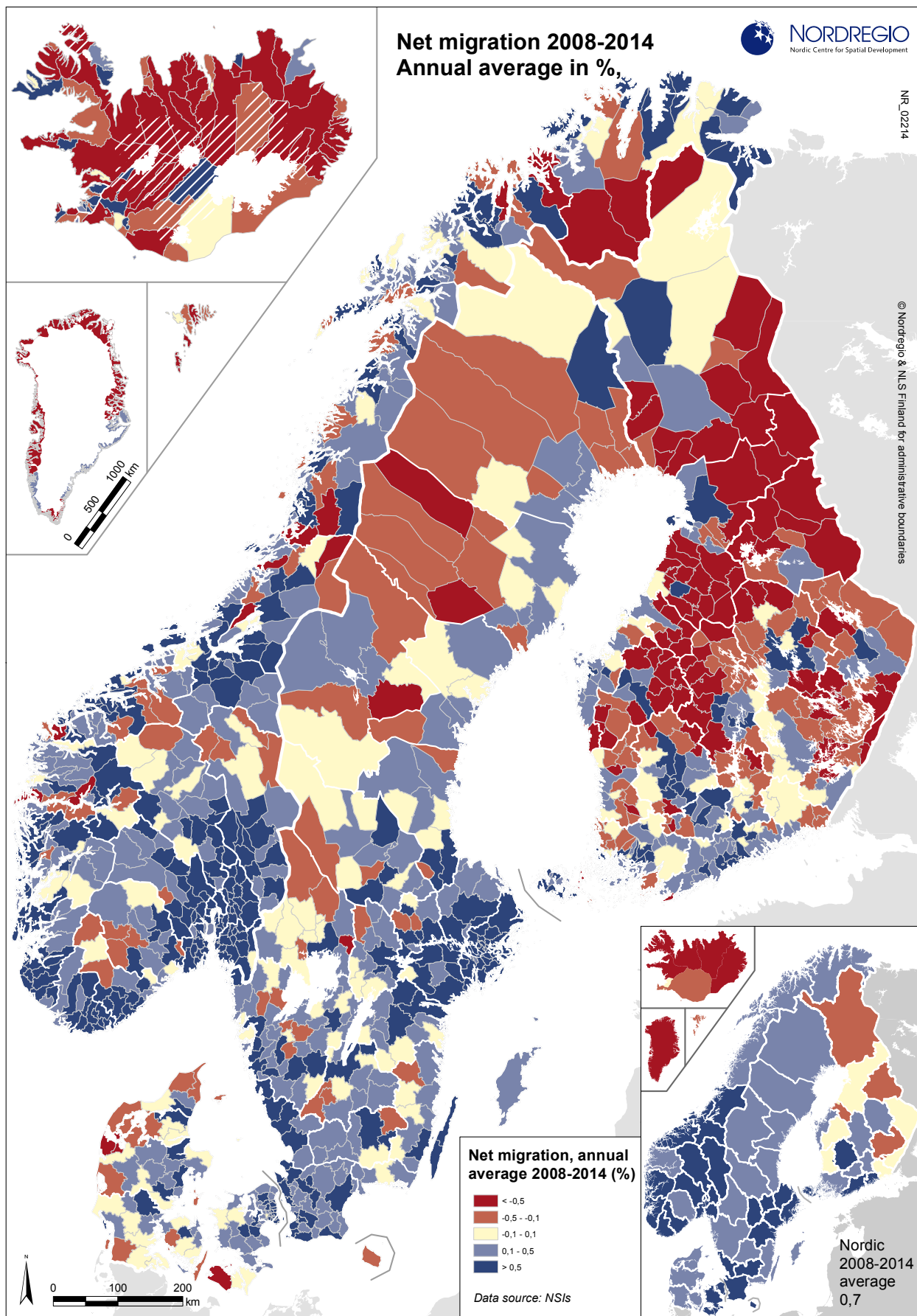


Figure 3.4: Net migration 2008-2014

land is the only country with only net emigration. Furthermore, the figure highlights that the intensity and direction of intra-Nordic migration flows vary from one Nordic country to another. For instance, all Nordic countries have relatively significant migration flows to and from Sweden. On the other hand, migration from and to Finland (including Åland) is relatively low from and to Denmark, Iceland and Norway, but high to and from Sweden. The latter can be explained by a long history of migration between the two countries, mostly linked to integration of Finnish nationals into the Swedish labour market. A very significant share of migration flows can be found between Sweden and Finland: 72% of the emigration from Finland to the Nordic countries ends in Sweden. A similar proportion can be found between Sweden and Norway, where 72% of Nordic immigrants in Norway originate in Sweden.

As already noted, the data on immigration and emigration can be broken into the percentage of national and foreign citizens, although there is a clear majority of foreign citizens in the intra-Nordic migration data, averaging 58%. The individual situations pertaining in each country are however rather different. For instance, figures on intra-Nordic immigration indicates that Denmark, Norway and Sweden have higher shares of foreign-born in-migration flows than the Nordic average (respectively 62%, 73% and 58%), whereas both Iceland with 14% and Finland with 25% are significantly below the Nordic average. These figures may reflect the changing attractiveness of the different labour markets but also the education possibilities in other parts of the Nordic Region thus resulting in the increased migration of nationals from Iceland and Finland.

The Faroe Islands and Greenland are not included in the illustration above due to their very small absolute figures of intra-Nordic migration. It is however worth mentioning that the share of intra-Nordic migration is significantly higher in these two territories than in the five Nordic countries at around 90%. This is primarily explained by their strong linkages to Denmark, representing more than 80% of the intra-Nordic flows and by the phenomena of re-migration. To a much lesser extent there was also a rather stable migration pattern between the Faroe Islands and Greenland during the period 2005-2014.

Migration at the regional and municipal levels

The map on net-migration (figure 3.4) illustrates the annual average changes from 2008, when the financial crisis started, to 2014. The Nordic Region had an annual average net migration rate of 0.7% during the period 2008-2014, but there is significant geographic variation between regions and between municipalities.

A very significant share of migration flows can be found between Sweden and Finland: 72% of the emigration from Finland to the Nordic countries ends in Sweden. A similar proportion can be found between Sweden and Norway, where 72% of Nordic immigrants in Norway originate in Sweden.

The map at the regional level indicates that all regions in Denmark, Norway and Sweden have net in-migration, highlighting that even the most remote regions in these countries succeed in attracting more inhabitants than they lose. The situation at the regional level in the Faroe Islands, Greenland and Iceland highlights that net in-migration to the largest settlements does not outweigh the prominence of the net out-migration in these parts of the Nordic Region. The situation in Finland is somewhere between these two since most regions located in the South-Western part of the country have net in-migration, whereas the regions in the remaining parts of Finland suffer from net out-migration.

The map at the municipal level clearly highlights different trends within each country where the municipalities with the largest settlements attract most of the migrants thus maintaining their population, whereas the most rural and sparsely populated parts of the Nordic Region suffer from population decline. This observation applies in particular to municipalities in Denmark, Finland, Iceland and Sweden. In Norway, net in-migration not only occurs in the most urban municipalities

but also in the majority of its rural municipalities. In the Faroe Islands and Greenland, where there is overall (national/regional) net out-migration, the municipal scale showcases their internal differences. For instance, the municipality containing Greenland's largest settlement (Nuuk) shows a net in-migration flow.

The map below (figure 3.5) highlights a clear divide between large urban areas and the rest of the Nordic Region for figures on domestic net migration in 2014. The majority of the municipalities (61%) are located primarily in rural or remote parts of the Nordic Region and suffer from net out-migration in terms of their domestic flows. The remaining municipalities experience net in-migration for domestic flows and are mostly located in the capital and metropolitan areas of Denmark, Finland, Norway and Sweden.

The map also highlights that a vast majority of municipalities (93%) have net in-migration for international migration flows. Only 86 out of 1 219 municipalities, mostly located in Greenland, Iceland, Finland and Norway have net out-migration.

Domestic net migration is the result of the difference between the in-migration and out-migration that takes place from one administrative unit to another one (municipality or region) within the same country. International net migration is the result of the difference between the immigration and emigration that takes place from one administrative unit to another (municipality or region) between two countries. The map below indicates domestic (left half of the circle) and international net migration (right half of the circle) in 2014 for municipalities of the Nordic Region (figure 3.5). The size of the circle indicates the absolute value of migration turnover (the sum of in-migration and out-migration) while the colour indicates the trend (blue for net in-migration and red for net out-migration).

The consequences of both net in-migration and net out-migration can pose significant challenges at the municipal level. In the case of significant net in-migration, municipalities often have to deal with issues relating to housing shortages and the inadequate provision of public services as well as the specific challenges that come with social integration. In the case of net out-migration, municipalities often need to find solutions to the rapidly changing nature of their demographic structure, i.e. reductions in their tax base as well as potential reductions in the active labour workforce and/or increases in the share of the 'dependent' elderly population requiring a significant level of public service support, including extensive health care.

The strategies developed to address both these types of challenges are diverse across the Nordic Regions and municipalities, ranging from strategies and actions to attract new inhabitants to those designed to help the

The Faroe Islands have launched an ambitious national strategy to reverse their emigration rates and hopefully increase the re-immigration rates.

municipality to adapt its local structures to the new situation. A number of remote municipalities have developed policies aimed at attracting and integrating migrants into their labour markets, thus providing a counterweight to the out-migration flows particularly of young people. One example of the level of awareness on this issue is a policy developed in Åland where policy makers have calculated the required volume of in-migration necessary to maintain an acceptable dependency ratio and thus have actively promoted immigration and integration (Hörnström et al 2015).

National policies have also been developed with the aim of maintaining populations in areas with high out-migration rates. The Faroe Islands have launched an ambitious national strategy to reverse their emigration rates and hopefully increase the re-immigration rates in the hope of attracting returnees who have completed their tertiary education and training programmes. At the regional level, there is also the recent Danish plan to relocate government jobs from the capital to other regions. A further example is the investment and development support for small grocery stores in rural areas in Norway (Hörnström et al 2015). The merging of small municipalities is also sometimes seen as a response to net out-migration trends with the expectation that larger municipalities may be better able to provide the necessary level of services to their inhabitants more efficiently. A number of recommendations designed to deal with net out-migration can be found in a working paper on local and regional approaches to demographic change (Johnsen et al 2014). Among the recommendations here are the better utilisation of private actors, coordination and cooperation between administrative levels and citizen engagement.

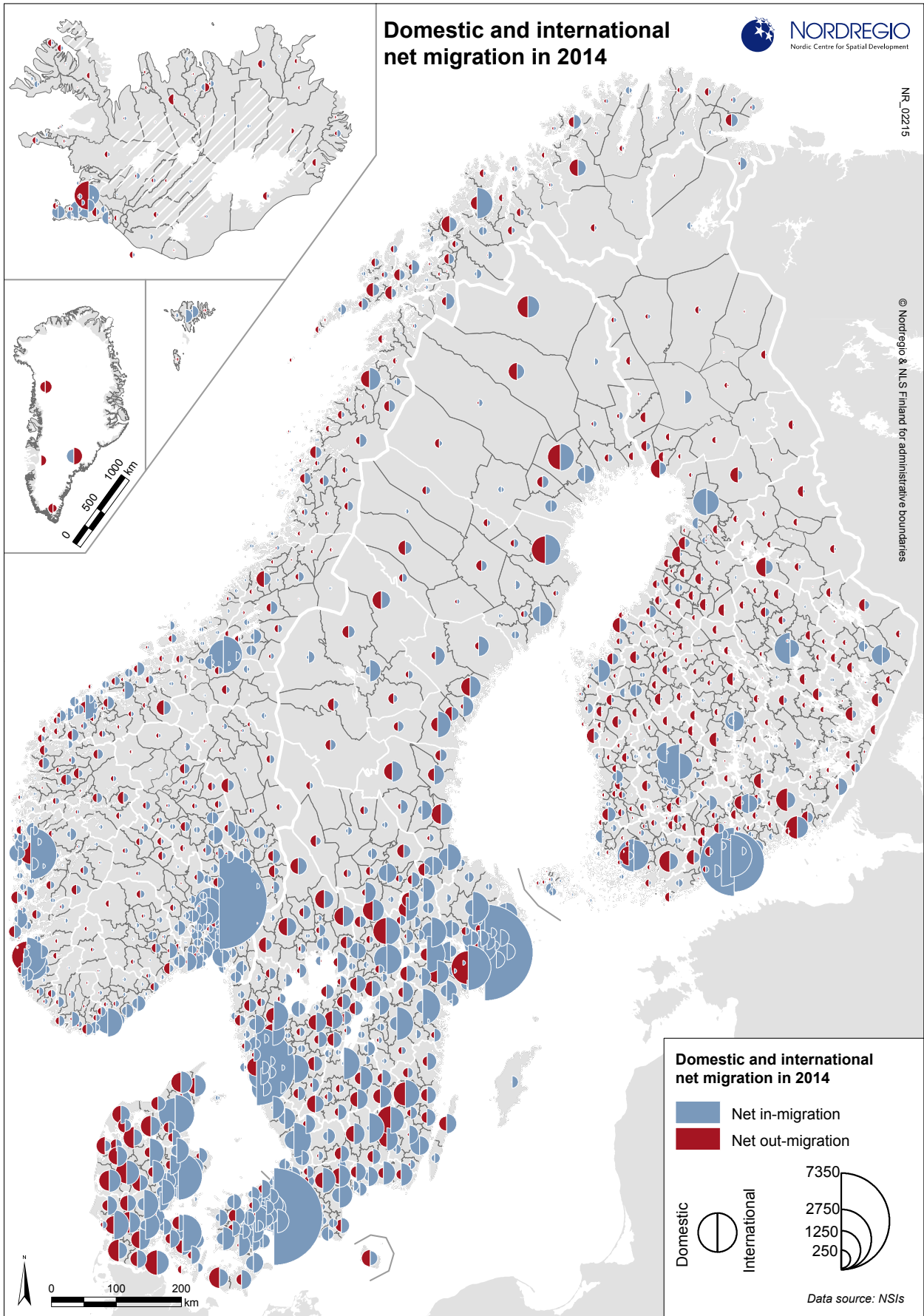


Figure 3.5: Domestic and international net migration in 2014

Chapter 4

AGE AND GENDER:

Growing challenges for rural and remote areas

Authors: **Julien Grunfelder, Andrew Copus and Michael Kull**
 Maps and data: **Julien Grunfelder**

It is well known that rural areas tend to suffer more from demographic challenges than their urban counterparts. The Nordic Region contains many sparsely populated municipalities that are affected by these demography challenges due to their remote location. This chapter provides an overview of the status and recent trends in population change, demographic dependency, youth age dependency and old age dependency, paying particularly attention to rural municipalities. It reveals that there are some interesting subtleties behind these notions of sparsity and demographic challenge.

The need to study and react to these socio-economic trends, structural transformations and demographic changes in European rural areas resulted in the development of a number of regional typologies. Typologies constructed at the regional level (NUTS3) tend however to obscure important details of the demographic redistribution; hence an analysis at the municipal level would be more pertinent.

The first section of this chapter introduces a classification of Nordic municipalities, based upon access to urban areas, which is subsequently used for analysing demographic trends. Section two describes the ongoing process of demographic redistribution while section three focuses on how this affects the composition of population in different kinds of locations, in terms of both age and gender.

Towards a typology of rural municipalities

A number of urban-rural typologies already exist at the NUTS3 level. These include, for example, the OECD Regional Typology of 2010, the EUROSTAT Urban-rural typology (2010) and the updated version of the ESPON Urban-Rural typology 2010. These typologies

Rural areas tend to suffer more from demographic challenges than their urban counterparts.

cannot effectively capture the more nuanced pattern at the municipal level and are therefore less useful as a framework for illustrating recent adjustments in demographic geography. The benefits of a higher resolution approach are illustrated by the typology by Malinen et al (2006) developed as a tool to support the implementation of rural policy in Finland. The Malinen typology was developed using a large number of indicators, including labour market and economic indicators.

Although the typology presented below is much simpler and less demanding in terms of data, it is encouraging to see that the results for Finland are similar to those of the Malinen typology. The typology distinguishes between municipalities which are dominated by an urban centre, those which are “urban adjacent”, and those which are rural. The rural group is further subdivided into those which are relatively accessible, and those which are more remote.

The drift towards urban and urban adjacent municipalities

The graph (figure 4.2) on population change during the period 2005-2015 provides a clear picture of the overall trend in rural-urban population redistribution in the

Classification of rural municipalities

Any attempt to better understand rural trends in the Nordic Region leading to the development of a classification of rural municipalities to serve as a basis for the analysis of demographic change needs to include elements related to their demographic size and the location vis-à-vis urban areas. This is because the vast majority of rural areas are reliant on towns and cities in their near or far proximity. Hence, this classification was developed for this chapter by including both population size (total municipal population in 2015) and accessibility measures to urban areas (an index summing up the share of the municipal population that can reach urban settlements of different sizes within 45 minutes by car; the index was developed by Tillväxtanalys for NordMap.se). The size of municipalities in the Nordic Region varies considerably in terms of population (and area), ranging from 53 to 911 989 inhabitants. A threshold of 20 000 is used in this typology (the average population size of a municipality being 21 703 in 2015, and the median 7 977). This threshold may be too high in some countries with very small municipalities in terms of both population and area sizes, while it is slightly too low in the Danish and Swedish contexts. It does however seem to provide a rather appropriate measure for the Nordic Region as a whole.

The four types of municipalities are:

- **Urban:** municipalities with 20 000 inhabitants and more where at least 90% of the population

can reach an urban settlement of 30 000 inhabitants and more within 45 minutes by car (240 municipalities, 17 802 963 inhabitants).

- **Urban adjacent:** rural municipalities with less than 20 000 inhabitants where at least 75% of the population can reach an urban settlement of 30 000 inhabitants and more within 45 minutes by car (238 municipalities, 2 311 744 inhabitants).

The remaining rural municipalities are divided in two groups:

- **Accessible rural:** indexed accessibility of 200 and more (286 municipalities, 4 852 633 inhabitants).
- **Remote rural:** indexed accessibility of less than 200 (455 municipalities, 1 511 073 inhabitants).

A fifth of the municipalities in the Nordic Region would accordingly be classified as urban, and these account for 67% of the total population. A further 20% (and 9% of the population) are classified as urban adjacent. Of the remaining 60% classified as rural, the majority (37% of all Nordic municipalities) are classified as remote rural, and 23% as accessible rural. These two types of rural municipality account for less than 25% of the population of the Nordic area. Most of this population (18% of the Nordic total) is in the more accessible rural municipalities. This means that although they account for well over one third of all municipalities, the remote rural group has less than 6% of the Nordic population.

Figure 4.1: Share of population in 2015, by type of municipality

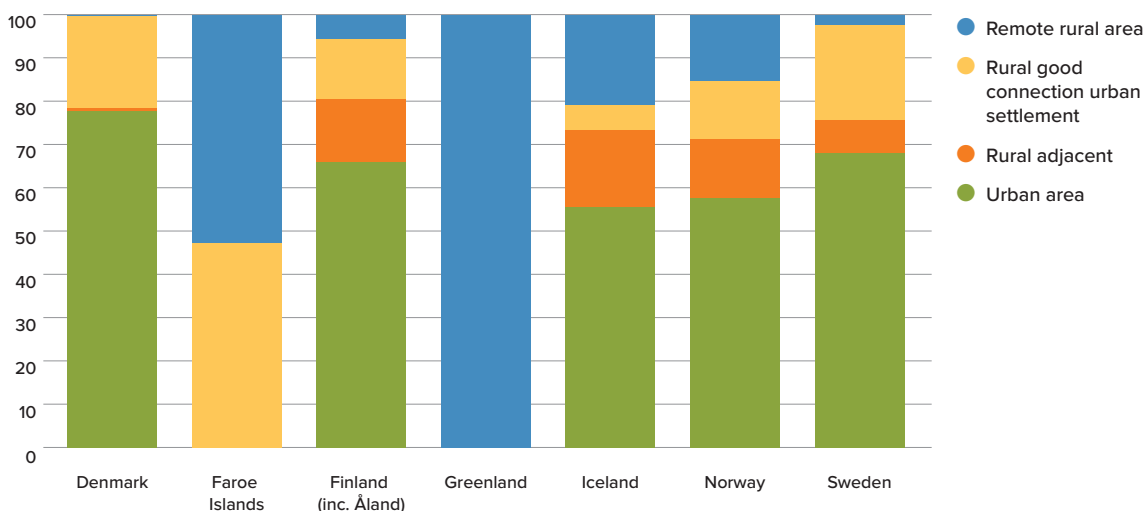
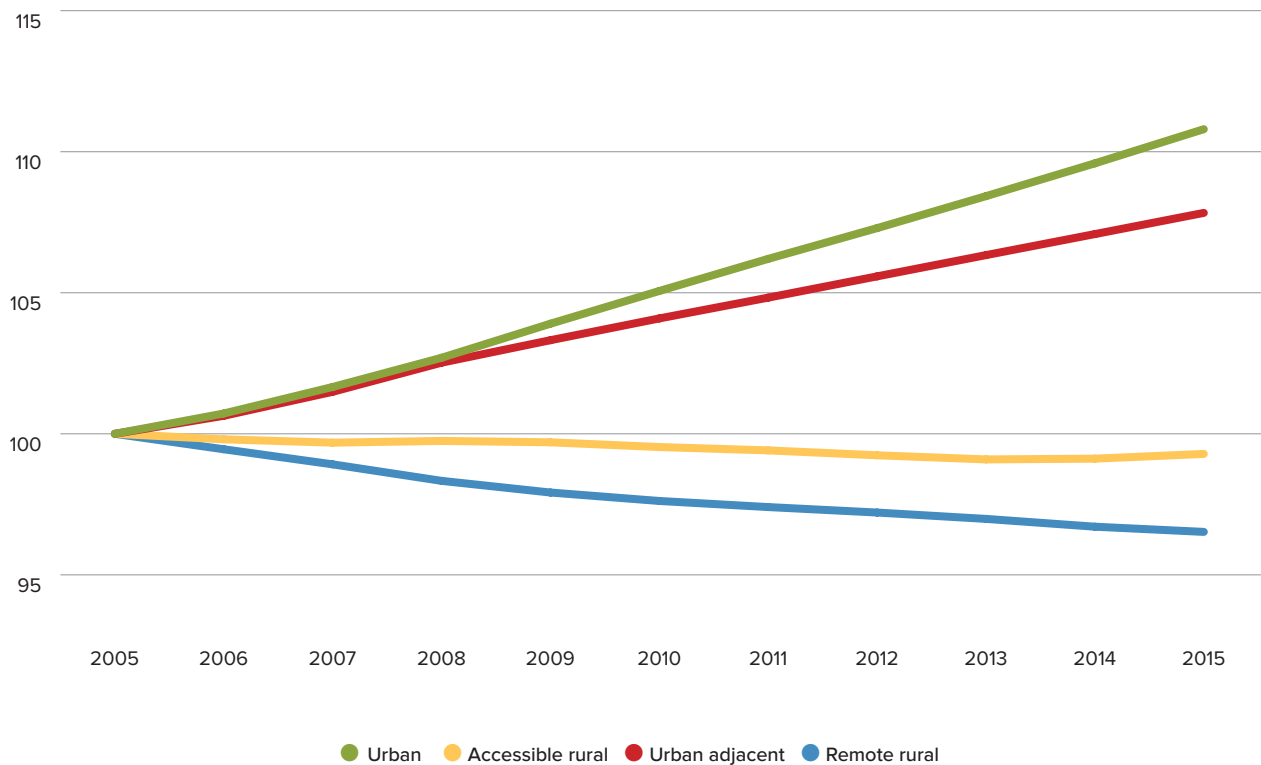


Figure 4.2: Total population by class of the rural classification of the Nordic Region, 2005-2015

Population change, year 2006=100



Data source: NSI's

Nordic countries. It highlights the fact that increases have been associated with urban (+11%) and urban-adjacent municipalities (+8%), whilst population decline has continued in the majority of rural municipalities, and especially in the remote areas (-3.5%). This pattern is common across Northern Europe. It implies obvious challenges for rural municipalities in terms of sustaining economic activity and adapting to new modes of service provision.

It is interesting to note that in the accessible rural municipalities the decline levelled off from 2013 onwards, and that these municipalities actually saw an increase in population between 2014 and 2015. It is tempting to speculate that this could be evidence of the beginnings of an outward 'ripple' of 'counter urbanisation', as observed in other parts of Northern Europe. This could imply a more positive socio-economic outlook in accessible rural municipalities. However only time will tell, and Nordic analysis has already shown that the configuration of administrative boundaries can mean that processes of sub-urbanisation around the urban fringe can "masquerade" as true counter-urbanisation (Amcoff 2006).

It is interesting to note that in the accessible rural municipalities the decline levelled off from 2013 onwards, and that these municipalities actually saw an increase in population between 2014 and 2015.

Men out-number women outside urban areas

The overall population shift described in the previous section hides some interesting nuances in relation to population composition, both in terms of gender and age. It has long been observed that employment push factors in rural and remote areas and educational pull factors in the cities are particularly strong in relation to younger women. One consequence of this is that gender ratios tend to show a deficit of women in the countryside and a ratio of more than 1:1 in urban and accessible areas (Figure 4.3 and figure 4.4). Indeed Figure 4.4 shows that in remote rural municipalities there are now only 96 women for every 100 men. Even in more accessible rural and urban adjacent municipalities the ratio is less than 1:1. Only in the cities are there more women than men.

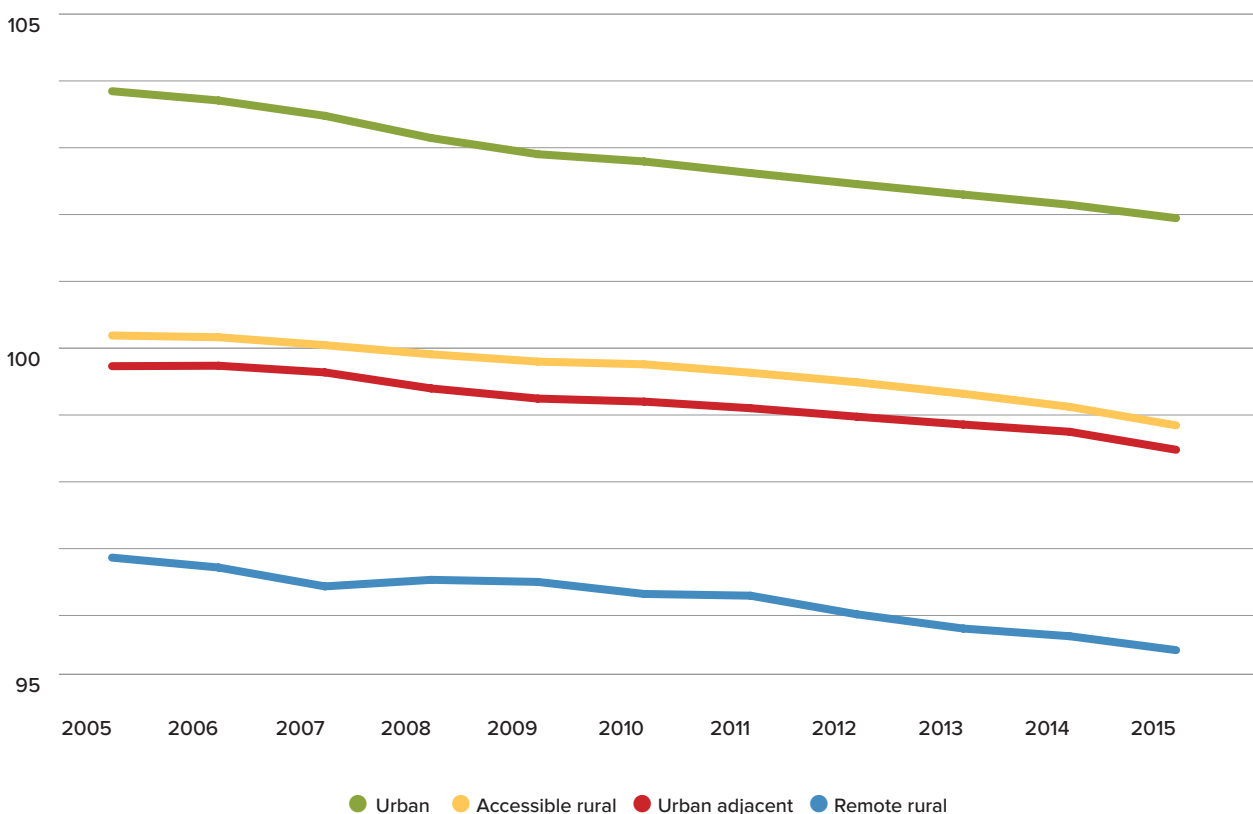
The map (figure 4.4) highlights differences between the countries and territories. For instance, gender imbalance is a more common situation in the rural and peripheral parts of Finland, the Faroe Islands, Greenland and Sweden than it is in Denmark and Norway. These

In remote rural municipalities there are now only **96** women for every **100** men.

differences can result from the presence or absence of policies on gender. For instance the Finnish ERDF programme aims at diversifying the rural labour market by making it more attractive to women, whereas Norwegian policies do not directly include this issue (Hörnström et al., 2015).

Figure 4.3: Female ratio by class of the rural classification of the Nordic Region, 2005-2015

Total number of females per 100 males



Data source: NSI's

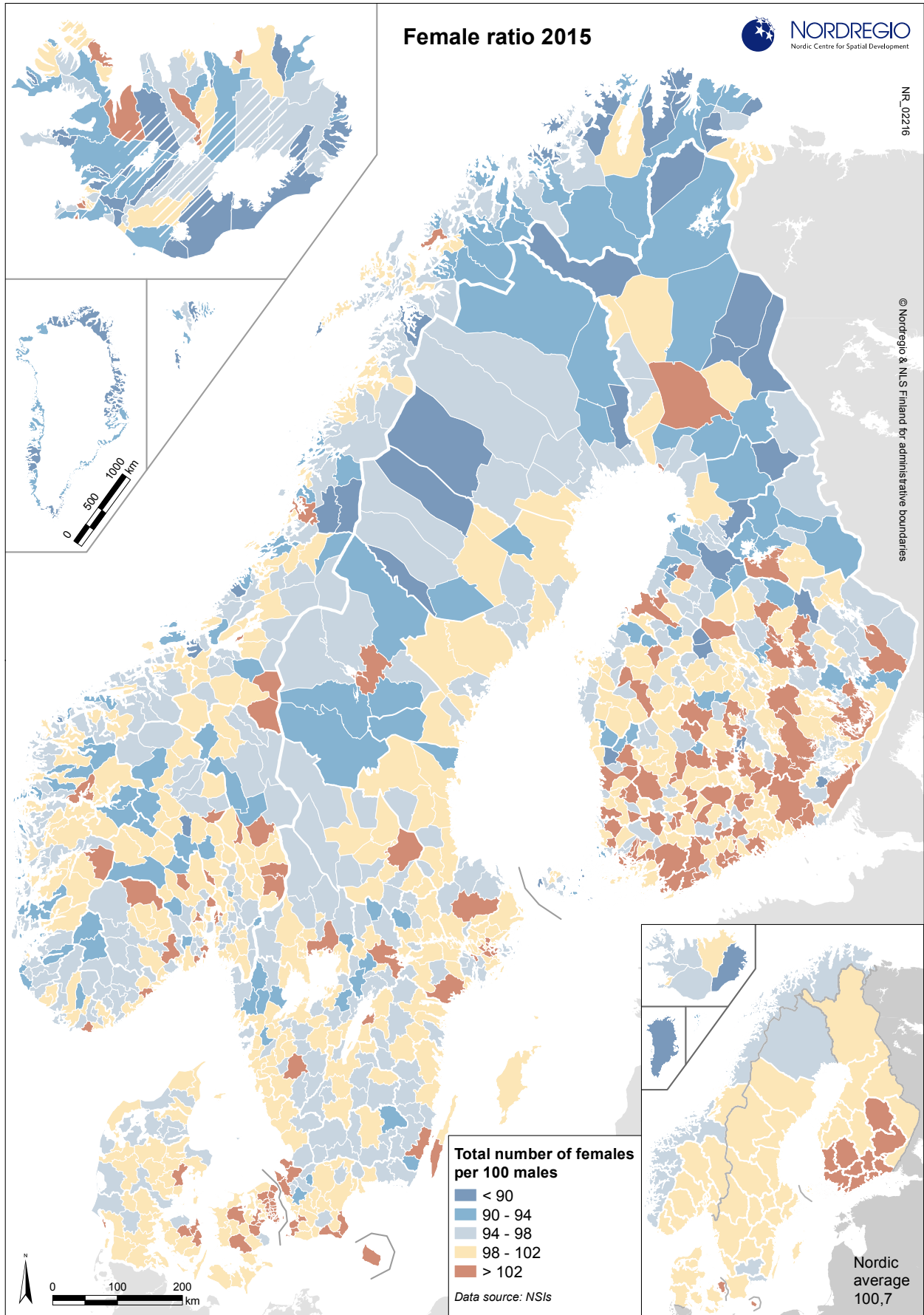


Figure 4.4: Female ratio in 2015

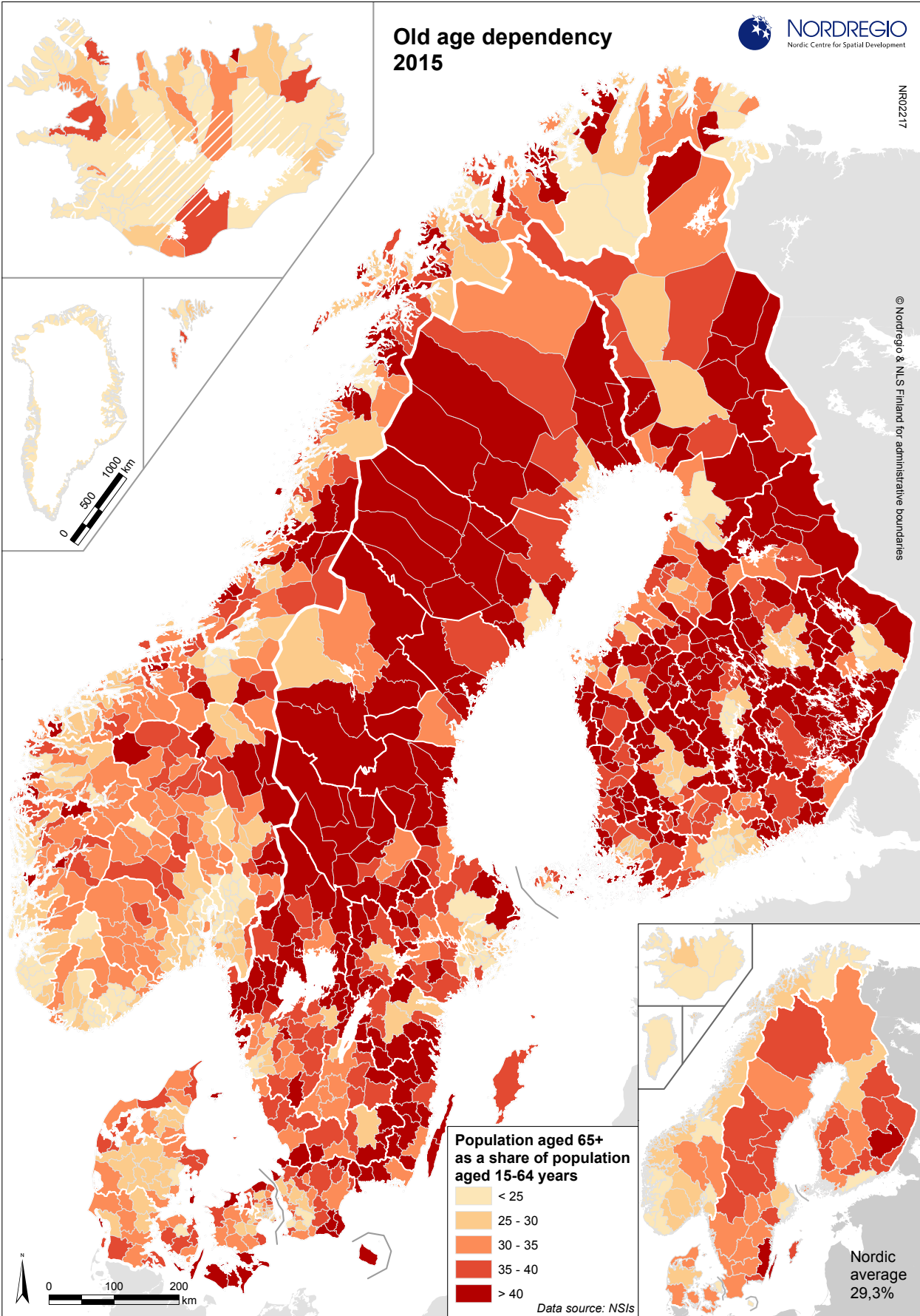
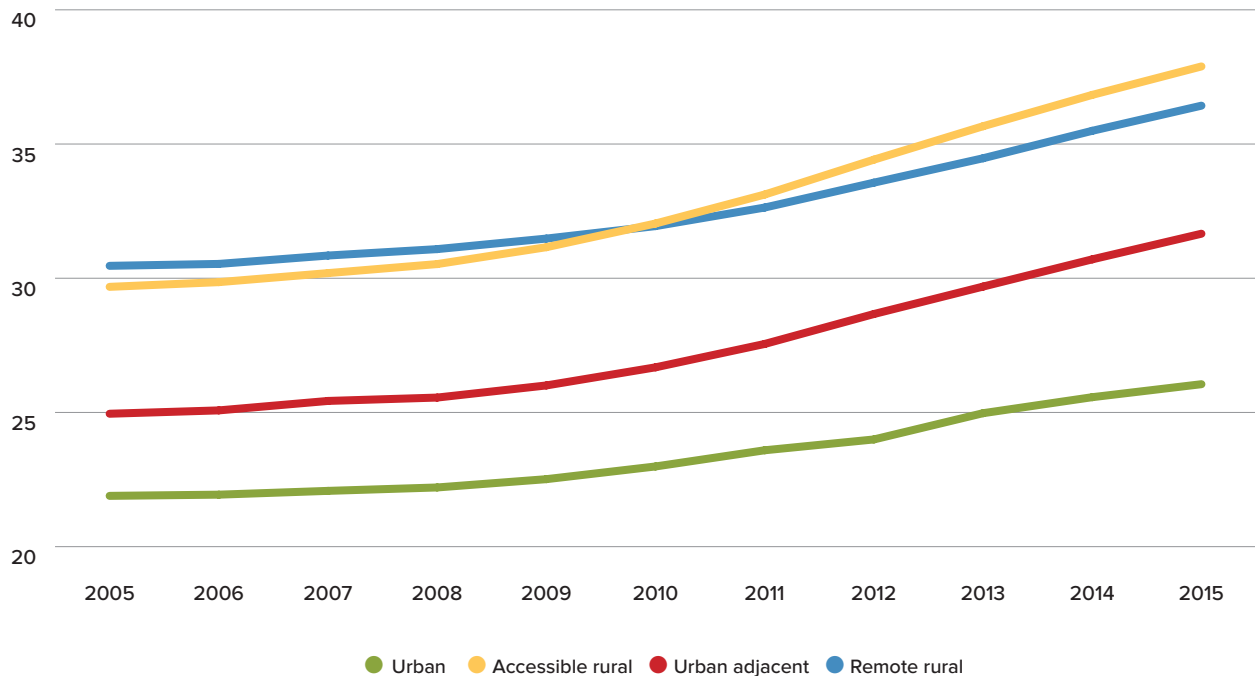


Figure 4.5: Old age dependency in 2015

Figure 4.6: Old age dependency ratio by class of the rural classification in the Nordic Region, 2005-2015

Population aged 65+ as a share of population aged 15-64 years



Data source: NSI's

Old age dependency puts pressure on Nordic healthcare systems

Dependency ratios show the proportion of the population which is outside the normal working age and is therefore dependent upon the economic activity and taxpaying capacity of others. For young people this is of course normally in the context of families and schools, but for older people this involves pensions and the provision of various social and health care services.

Old age dependency rates are rising across the Nordic countries (as they are across much of the Western World), but due to the selective outmigration of younger people towards the cities and adjacent areas, dependency rates are particularly high in rural municipalities (Figure 4.5). The highest rates can be found predominantly in insular municipalities of Finland (e.g. Kustavi) and Denmark (e.g. Læsø) and in a rather large number of rural municipalities in Finland (e.g. Luhanka) and along the Finnish-Swedish border (e.g. Pajala). The lowest rates can be found in both Greenland and most of Iceland as well as in the largest urban areas in Denmark, Finland, Norway and Sweden. What is particularly interesting in Figure 4.6 is the fact that since 2010 old age dependency rates in more accessible rural areas have outstripped those of the

Old age dependency rates are rising across the Nordic countries, but due to the selective outmigration of younger people towards the cities and adjacent areas, dependency rates are particularly high in rural municipalities.

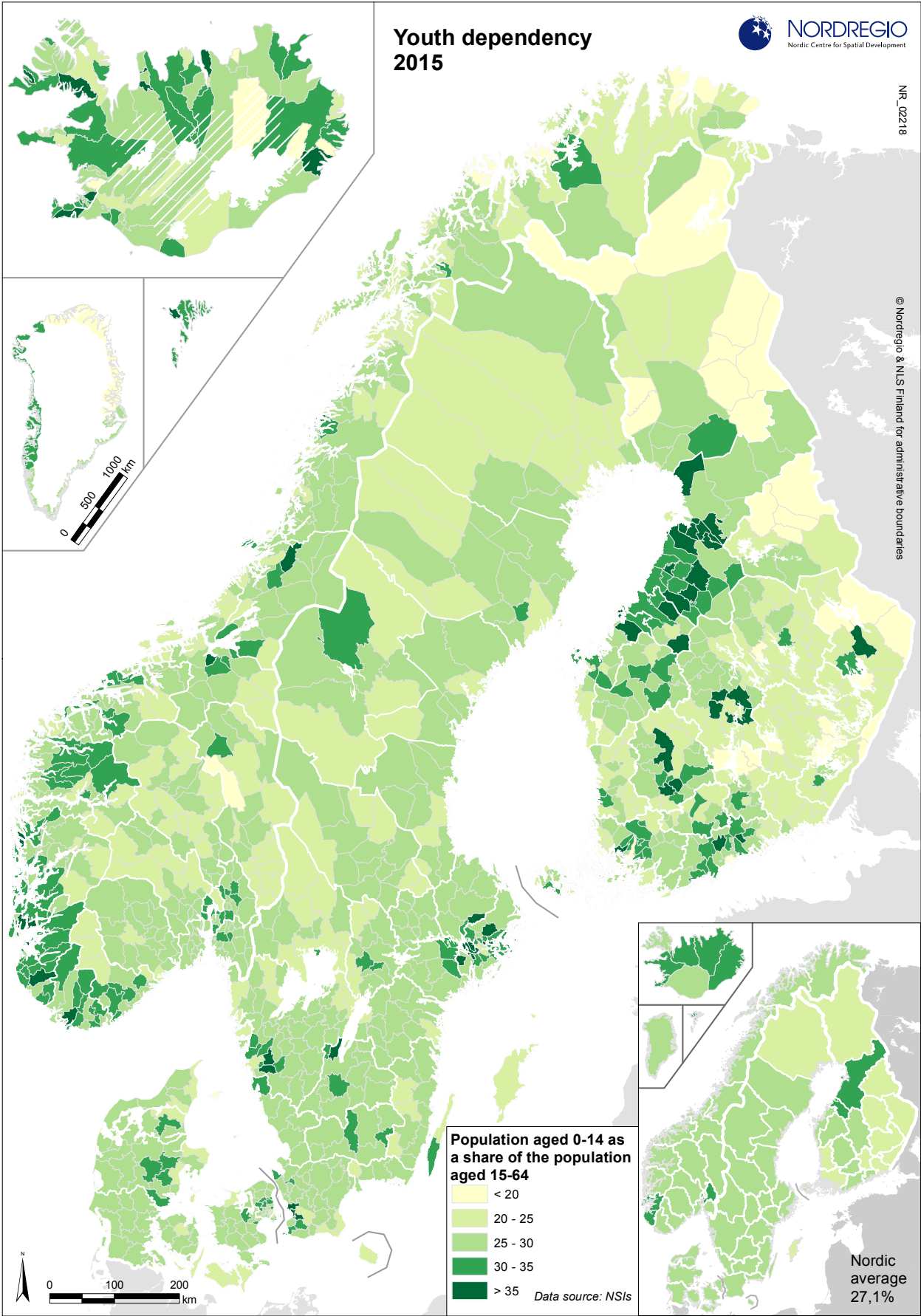
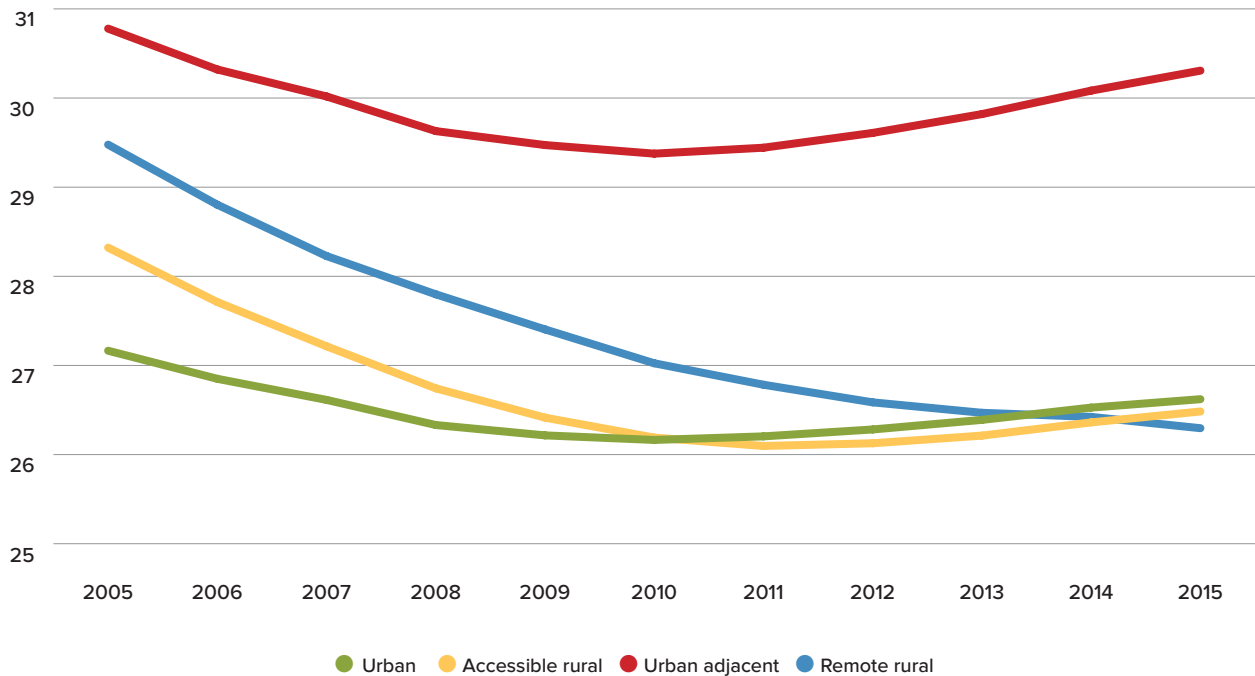


Figure 4.7: Youth dependency in 2015

Figure 4.8: Youth dependency ratio by class of the rural classification in the Nordic Region, 2005-2015

Population aged 0-14 as a share of the population aged 15-64 (in %)



Data source: NSI's

remote rural municipalities. One may speculate that this reflects the tendency for frailer elderly people to move to slightly larger settlements where specialist care and health services are easier to access.

Access to health and care services is one of the major issues in areas with high old age dependency ratios. A number of innovative solutions have been put in place in several parts of the Nordic Region. The region being the main authority responsible for providing health services, these solutions often emerge as the result of cooperation between regions, both within a single country and between adjacent regions in different countries. For instance cross-border solutions have been developed between Sweden and Finland and between Norway and Sweden with some success, even though some challenges remain (Johnsen & Perjo, 2014). National authorities are also key players in the struggle to tackle the basket of issues associated with having a high share of elderly population. For instance, digital solutions for access to health care services constitute part of a national strategy in Denmark with a focus, among other things, on telemedicine and telehealth (Hörnström et al., 2015).

A number of innovative activities designed to address the consequences of old age dependency have therefore been developed throughout the Nordic Region. In Finland, as in other peripheral parts of the Nordic Region, centralised care systems for the elderly based in munic-

Since 2010 old age dependency rates in more accessible rural areas have outstripped those of the remote rural municipalities.

ipal centres with the aim of 'reaching out' to customers in remote and distant places, are expensive to organise (Vihinen & Moilanen, 2013). Furthermore, profitability levels for private sector service providers under these conditions are likely to be limited, further threatening the supply of social and health services. Under their service obligation agreements, municipalities might arrange home care services not by themselves but through other service providers in the countryside - small organisations or companies whose main objective is not profit

maximization but rather the safeguarding of services addressing local needs (Kettunen et al. 2015). These services are viewed as Services of General Interest or as Services of General Economic Interest (e.g. Kull 2013).

Drastic decline as youth move to urban areas

The pattern of youth dependency rates (Figure 4.7) is rather different, and, again raises interesting questions for policy, particularly as it relates to education and training provision. Over the previous decade, the highest youth dependency rates have been in urban adjacent municipalities (e.g. Liminka and Ii in Finland, Rennesøy in Norway, Knivsta and Vaxholm in Sweden). Some have seen a net increase in the under 15 age group, as young families move (for well-being reasons) to municipalities which are close to the countryside but still within commuting distance of major employment centres (figure 4.8). In fact, prior to 2010, dependency rates in such areas showed a gentle decline. Since 2011 they have however displayed a consistently positive trend. In 2005 Urban municipalities had the lowest youth dependency rates, with rural (both accessible and remote), occupying intermediate positions. By 2015 these three types of municipality had converged, all having youth dependency rates about 4 percentage points below those of the urban adjacent municipalities. In other words the rural municipalities (especially the remote ones) had seen a significant fall in the proportion of their population in the under 15 age group.

A manifestation and illustration of youth dependency trends can be seen in Finland, where in the 2000-2009 period one-fifth of all primary schools were closed, mainly in sparsely populated areas (40%) and rural heartland areas (25%) (see Vihinen & Moilanen 2013, Ponnikas et al. 2011). The majority of sparsely populated rural municipalities are located in the northern and eastern parts of Finland, such as in the regions of Lappi, Kainuu, Pohjois-Karjala and Etelä-Savo. The majority of municipalities located in rural heartland areas are in the regions of western and southern Finland, such as in Etelä-Pohjanmaa and Varsinais-Suomi. From a local perspective, schools, and village schools in particular, are often seen as central to keeping rural areas populated (e.g. Kettunen 2013). The reduction in public transport provision represents a further threat in terms of curtailing the ability of some to access centrally located schools - private arrangements on behalf of the parents to organise joint transportation are used. Remote schooling is conditioned by an available and functioning broadband internet service (Vihinen & Moilanen 2013).

Concluding comments

The key point which may be derived from the above brief analysis of gender and age profiles across the four types

In Finland in the 2000-2009 period one-fifth of all primary schools were closed, mainly in sparsely populated areas (40%) and rural heartland areas (25%).

of municipality is that the pattern of change is more complex than the crude generalisations about patterns of demographic ageing would suggest. It shows that the simple binary distinction between urban and rural is not as helpful as is often assumed to be. Urban adjacent, accessible and remote rural municipalities are each experiencing different combinations of change in terms of gender, old-age and youth dependency.

One way to secure services in rural areas that cater to the needs of a range of residents is to introduce multi-service points. Multi-service points are, for instance, arranged in village schools or village shops. Services provided include municipal catering for the elderly, collection of groceries, transport as part of home care, internet points to access electronic public services or afternoon care for pupils (Kettunen et al. 2015). A number of other noteworthy examples exist throughout the country, where activities are arranged to tackle the different dimensions of demographic challenges in a concerted manner. The non-profit association Velkuan Kummeli in the archipelago municipality of Velkua in south western Finland for instance combines day care, afternoon activities for pupils, accommodation for the elderly / homecare for elderly people and health services etc., "under one roof".

Various policy recommendations for youth involvement have been listed as a result of workshops with young people in a number of case studies throughout the arctic part of the Nordic Region (Karlsdottir & Jungsborg, 2015). One of the listed recommendations is to include the local youth population by creating a youth council facilitated by an adult and a contact person from the municipality. Similar experiences can be found in other parts of the Nordic Region as in the region of Kalmar in Sweden (Johnsen & Perjo, 2014). At the regional level, the authorities are also working on increasing their attractiveness as a method of addressing the demographic challenges they face.

Signs of recovery: High employment, low unemployment

The Nordic countries are performing well on indicators relating to labour force participation and education when compared to the EU as a whole. They enjoy higher rates of employment; lower rates of unemployment; higher rates of school completion; and high tertiary attainment rates, particularly among women. The average employment rate for the Nordic Region was 73.4% in 2014 compared with an EU average of 64.9 %. This figure reflects a post global financial crisis recovery in most countries, with a clear exception in Denmark where the employment rate has continued to drop. Notably, Iceland, which experienced the sharpest drop following the financial crisis, now has an employment rate well above the Nordic average. Education levels are also high in the Nordic countries, though perhaps not surprisingly, the highest levels of education can, to a large extent, be found in metropolitan areas, socio-economically strong municipalities, and university cities. Access to education is a key driver for young people to move from rural areas to larger centres.

Despite these overall positive trends, there are regional and demographic differences which warrant consideration. Youth unemployment rates, though lower than the European average, remain at an alarming level in certain regions. Overall employment rates remain higher for males than females, though, again, the Nordic countries perform well in comparison to others. Finally, despite the Nordic countries' strong performances on indicators related to education the overall trend is negative if you look at the PISA results.

Theme 2

LABOUR FORCE

About the labour data

All the labour data used in this report has been adjusted to the Labour Force Survey. There are two main sources of information on employment and unemployment: Labour Force Surveys (LFS) and register based statistics. All of the Nordic countries have a system of register based labour market data. Regarding employment, the available data is usually around two years old, stemming from the long processing time required. Register data of unemployment is available monthly and usually with only a short time lag. For the Nordic countries, register based data is available on the municipal level. However, the drawback with register-based data is that it is not comparable between countries.

The other method for measuring employment – Labour Force Surveys – is based on monthly surveys which in the Nordic countries are conducted by the national statistical institutes. There are international rules (ILO) on how the surveys shall be conducted. In principle, if the sample is large enough (which is generally the case in the Nordic countries), these figures are comparable between countries. The samples are also extended at least once a year in order to make regional estimations. For these estimates however significant margins of error exist, particularly in regions with small populations. E.g. in the case of Åland, the sample size for many labour force surveys is too small.

Chapter 5

EMPLOYMENT: Nordic countries strong in international comparisons

Authors: **Anna Karlsdóttir, Gustaf Norlén and Linus Rispling**

Maps and data: **Gustaf Norlén, Linus Rispling, Shinan Wang, Anna von Zwegbergk and Julien Grunfelder**

The relatively high historic rate of labour market participation among females in the Nordic countries is a trademark of the region. Labour markets with a gender imbalance where fewer women participate than men may not only be economically counterproductive, but also pose questions over basic issues of equality. By international standards, the Nordic countries continue to retain their vanguard position with a high proportion of females in the workforce. In spite of this status, males remain the dominant group across the Nordic Region when female and male employment rates are compared. The male employment rate increased slightly during the period 2012-2014 while it has decreased for females.

Wage and income distribution in the Nordic countries is more even than in many other Western countries. The corporatist Nordic bargaining systems help keep wage inequality at lower levels than in most other European countries, but it is nevertheless evident that, over time, the wage structure and income inequalities in the Nordic countries have become less distinctive compared with other European countries. The employment rate (high or low) does indicate regional economic resilience in terms of productivity and economic growth, or the lack thereof. Employment is one of the EU2020 targets; the goal is to reach 75% employment in Europe by 2020 (measured for age group 20-64 years). Sweden, Denmark and Finland have also formulated their own goals. Sweden and Denmark have set the goal of having an employment rate above 80% while for Finland the rate was set at 78%.

Employment follows a clear pattern

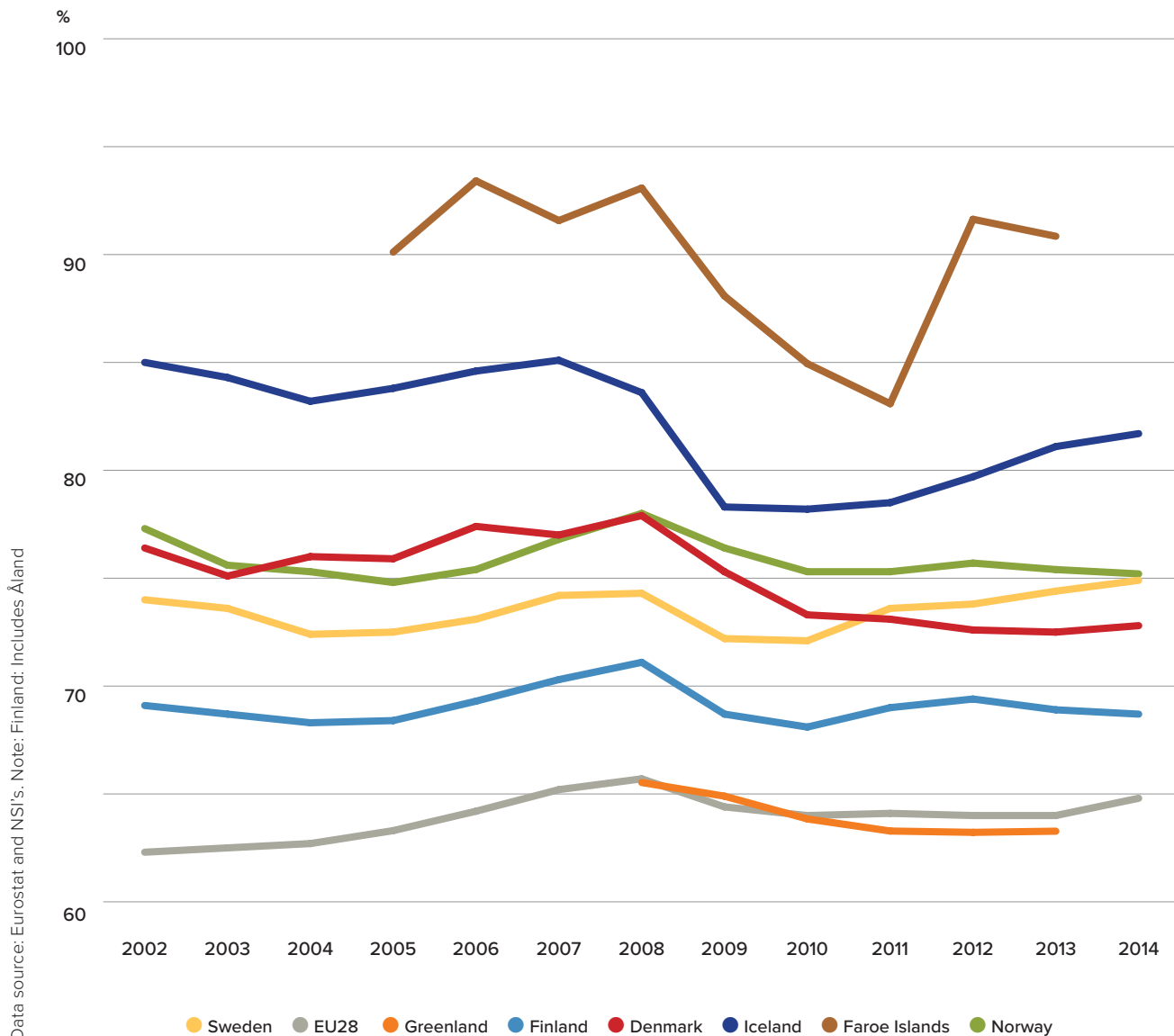
Compared to the EU average, employment rates in the Nordic countries are relatively high. The average employment rate for the Nordic Region in 2014 was 73.4%, which can be compared to the EU average of 64.9%.

The average employment rate for the Nordic region in 2014 was 73.4%, which can be compared to the EU average of 64.9%.

Looking at the development over time we can see that the employment rate was one factor that was affected by the financial crisis in 2008, particularly in the smaller economies such as Iceland where it dropped significantly (albeit from a very high level). As figure 5.1 shows, the labour market has since recovered in most countries. Denmark is a clear exception, with a dropping employment rate from 2008 to 2013 and where a stabilisation only began to occur between 2013 and 2014. Finland and Norway have both seen slight decreases in employment rates again after 2012.

Although the general picture in the Nordic Region is that the employment rate is high, there are regional differences and some clear patterns are visible when you zoom down to the municipal level. As seen in figure 5.2 the clearest pattern is the low employment rates in eastern and northern Finland, where many municipalities have employment rates significantly lower than the EU average.

Figure 5.1: Employment rate (15-64 years), 2002-2014



Data source: Eurostat and NSI's. Note: Finland: Includes Åland

Employment rates are high in the small Island economies of the Faroe Islands, Iceland and Åland, in relation to mainland Finland (between 75 and 90%). These stick out as the regions with the highest employment rates in the Nordic Region.

Together with Kujalleq in Greenland all of the 65 municipalities with the lowest employment rates are Finnish (with employment rates between 52 and 59%, i.e. also below the EU28 average). Geographically, this is mainly true for the eastern and northern parts of the country. In addition to Åland also Pohjanmaa (77%) and Uusimaa (74%) had employment rates above the Nordic average.

Norway has a high employment rate in general, only one region, Østfold, had employment rate below the

Nordic average in 2014. In the main, it is municipalities close to the Swedish border that had a relatively lower employment rate; such as Stor-Elvdal, Kongsvinger and Eidskog in Hedmark (64-67%) and Halden, and Sarpsborg in Østfold (66-67%).

Only four of the Swedish regions had employment rates slightly under the Nordic average – Värmland, Skåne, Gävleborg and Östergötland. The municipalities in the north that have a strong mining and industrial tradition generally have high employment rates. Kiruna and Gällivare, for example, have employment rates around 80%. Malmö however sticks out with its low employment rate (under 65%). Even adding those commuting to Denmark however, Malmö has a low employment rate in a Swedish context.

The Danish regions all have employment rates close to the Nordic average in 2013 - from Midtjylland (72.9%) to Syddanmark (71.2%). Municipalities close to Copenhagen - Allerød, Egedal, Dragør and Hørsholm have employment rates around 80%. Odense, Langeland, Svendborg and Nyborg in Syddanmark are among the municipalities with the lowest employment rates in Denmark (65-69 %).

In general, the capital municipalities are close to the Nordic average and thus are usually not at the top in a national context: Oslo - 76%, Stockholm - 78%, Helsinki - 70%, København - 68% and Reykjavik - 75%.

In Sweden government consumption is expanding due to higher spending on integrating migrants, education and care for the elderly. Despite relatively modest economic activity, employment has grown particularly strongly in recent years. It has recovered well from the financial crisis and has already reached pre-crisis levels, with the employment rate among the highest in the EU (European Commission 2015).

The Swedish government hopes to be able to integrate the highly educated immigrants into the labour market more quickly. 30% of the immigrants have a higher education. An inventory has also shown that they often have the competences that are most sought after: such as engineers, technicians, specialist physicians, etc. It continues however to take a long time for these newly arrived immigrants to successfully break into the labour market (Arbeidsliv i Norden 2015a). The Danish authorities are also addressing policies to better integrate and more fully involve refugees and those from immigrant populations into jobs (Arbeidsliv i Norden 2015b).

The Finnish authorities emphasise on restoring growth and promoting competitiveness, as well as on spurring employment. As such, they view job creation as one of the main challenges for the economy. They are also seeking to address the risks posed by weak export performance in the context of industrial restructuring. Fin-

The Swedish government hopes to be able to integrate the highly educated immigrants into the labour market more quickly.

By international standards, the Nordic countries continue to retain their vanguard position with a high proportion of females in the workforce.

land is still struggling to translate R&D investment into successful exports. It should provide more financing for start-ups and offer them more help enabling them to do more business abroad. Furthermore, in view of the ageing population and shrinking working-age population, it is important that the labour market makes use of the full potential of the workforce (European Commission 2015).

Finnish labour market reforms have been one of the hottest topics for the new government. The goal is to lift Finland out of the economic crisis. Finland's governance culture is very consensus-oriented with fixed power relations between unions, employers and the government. This makes change hard to achieve. The new government is however looking for a new deal that will lower labour costs. Another measure could be to lower the rate at which unemployment benefits are provided (Arbeidsliv i Norden 2015c).

Nordic countries leading on gender balance

Figure 5.3 shows the difference in employment rates between men and women. In most regions the male employment rate is higher than the female employment rate; it is mainly in the northern and eastern parts of Finland that the female employment rate is higher. A few regions have a balanced gender employment ratio. These include various types of municipalities: in Finland cities that have universities' or tertiary educational opportunities, e.g. Joensuu, Helsinki, Tampere, Kuopio and Turku are prominent in this list. In Denmark only municipalities within the Copenhagen metropolitan area have a gender balanced employment ratio (Frederiksberg, Herlev, Ballerup, Tårnby and Allerød). Whereas in Sweden, a gender balanced employment ratio is only found in the municipalities of Värmland and Västra Götaland (where it is common for men to commute on a weekly basis across the border into Nor-

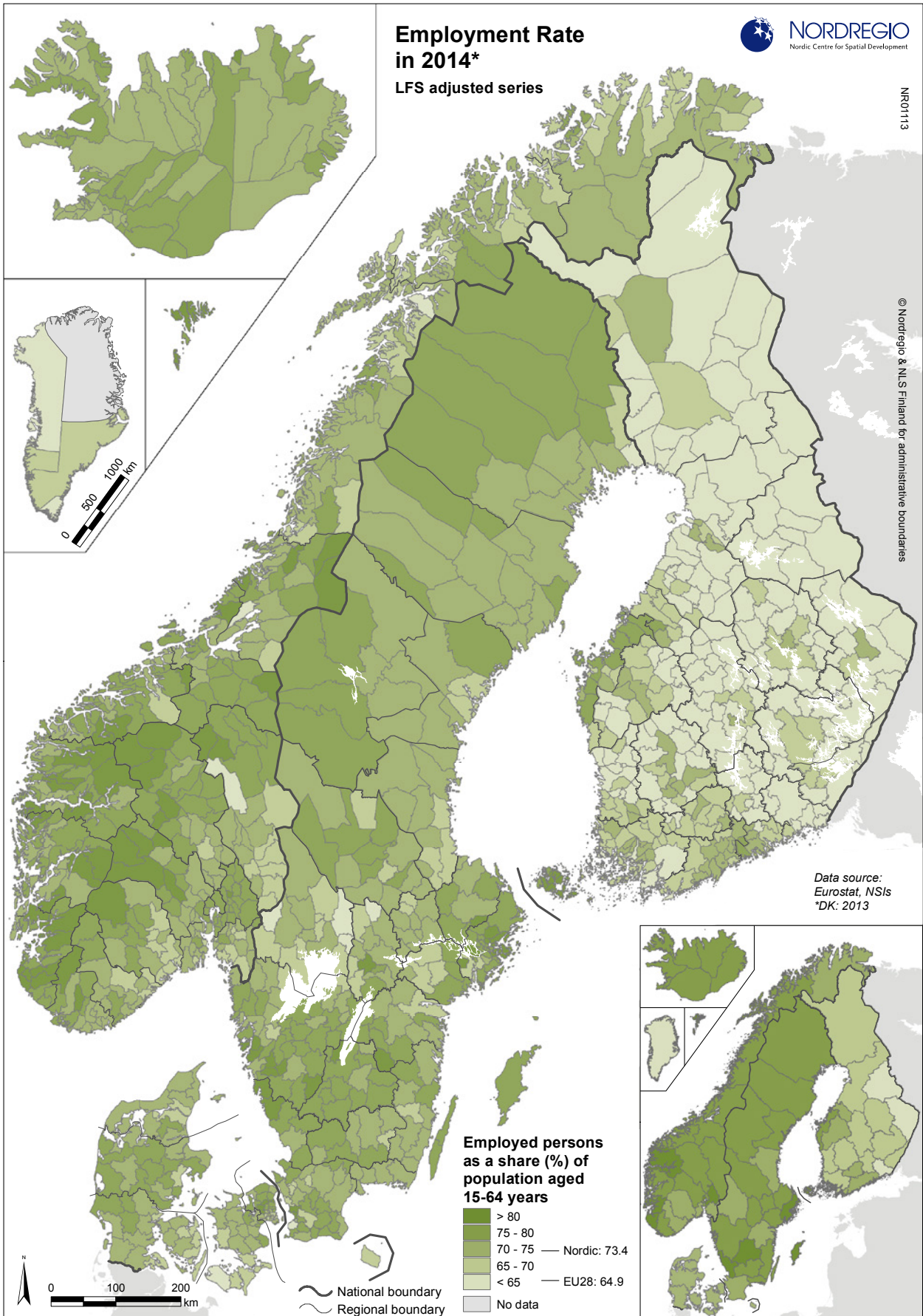


Figure 5.2: Employment rate (15-64 years) in 2014 – Labour Force Survey adjusted series

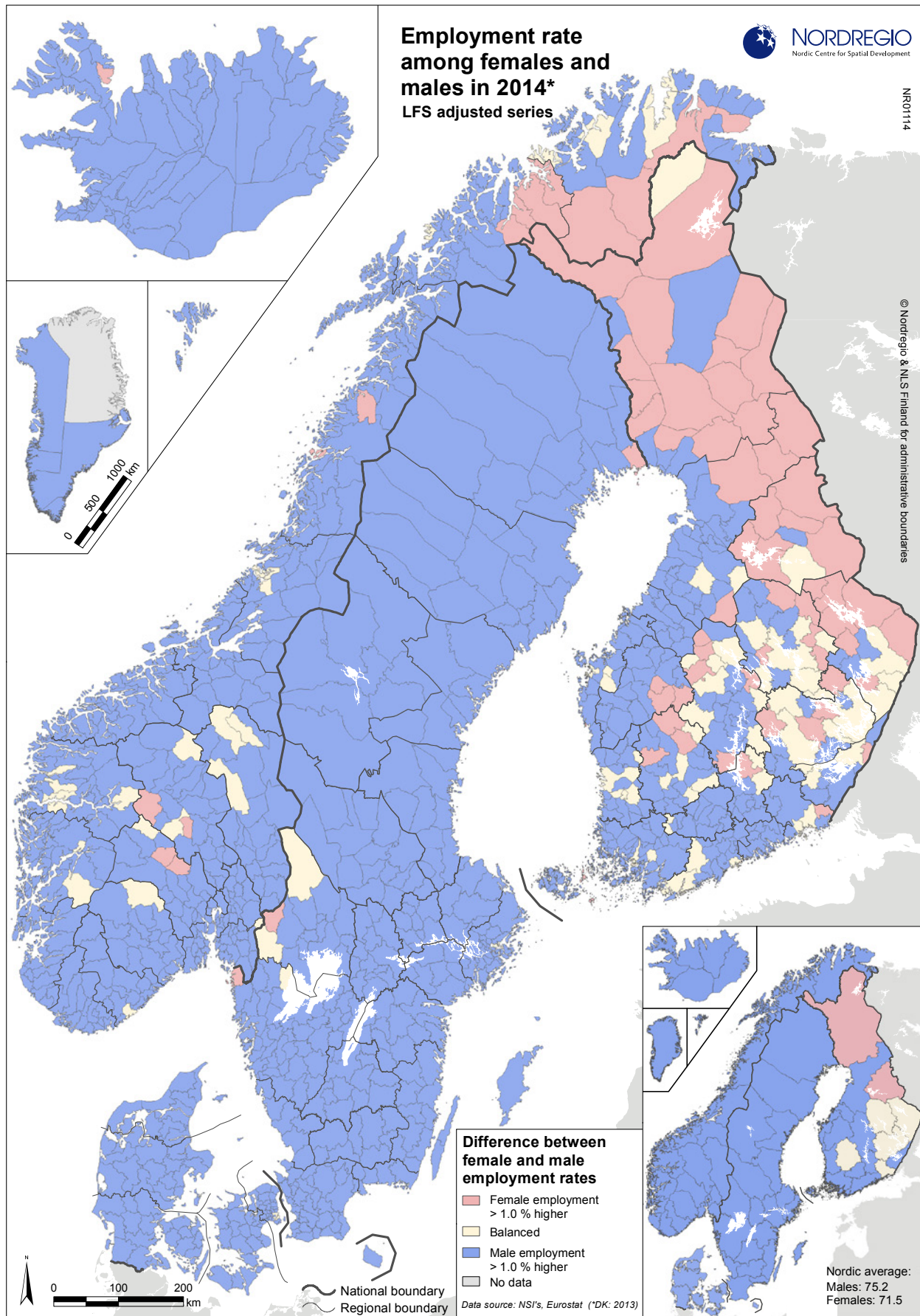


Figure 5.3: Employment rate among females and males in 2014 – Labour Force Survey adjusted series

way, which skews the statistical data). In Norway quite a varied mix of rural and small town municipalities in Oppland, Buskerud, Telemark, Hordaland, Sogn og Fjordane along with Troms and Finnmark have gender balanced employment ratios. In the North Atlantic, the Faroe Islands, Iceland and Greenland have no municipalities which are completely gender balanced in labour market terms. In Åland there is one municipality, Kökar, which has a higher employment rate for females.

The relatively high historic rate of labour market participation among females in the Nordic countries is a trademark of the region. Labour markets with a gender imbalance where fewer women participate than men, may not only be economically counterproductive, but also pose questions over basic issues of equality. For example, among the OECD countries, Finland, Iceland, Norway, Sweden and Denmark are all among the top grouping of OECD countries with regard to the employment rate for women. Nordic co-operation has also focused on increasing awareness about gender equality among the people of the region, parliamentarians, governments and the Nordic Council of Minister's own organs and projects. Among their many broad socio-economic goals the Nordic countries, (including the Faroe Islands, Greenland and Åland) seek to ensure that women and men have equal opportunities to participate in the labour market and to be financially independent (Nordic Council of Ministers 2015).

Wage and income distribution in the Nordic countries is more even than in many other Western countries. The corporatist Nordic bargaining systems help keep wage inequality at lower levels than in most other European countries, but it is nevertheless evident that, over time, the wage structure and income inequalities in the Nordic countries have become less distinctive compared to other European countries. There are however a number of other factors affecting gender related pay distribution, such as unemployment levels, access to and the organisation of childcare, the generosity of the unemployment insurance schemes and to other benefits (Andersen et al. 2014).

Wage and income distribution in the Nordic countries is more even than in many other Western countries.

The Nordic average for male employment participation is 75.2% in 2014 while it is 71.5% for females.

Males still predominate in the labour market

In spite of this status, males remain the dominant group across the Nordic Region when female and male employment rates are compared. The Nordic average for male employment participation is 75.2% in 2014 while it is 71.5% for females. The Nordic average employment rate has grown marginally since 2012 for both male, where it was 75% and female, where it was 71.2%. Some of the reasons explaining the difference between male and female employment rate may concern the sectoral structure and proportional labour need in a labour market that is seemingly still gender segregated.

As figure 5.3 shows, the male employment rate is at least one percentage point higher in most of Norway, Sweden, Denmark, Iceland, along with the Faroe Islands and Greenland. This is also the case for the south western corner of Finland. In general however, regional variations in Finland are much more evident than elsewhere in the Nordic countries.

Employment in the Nordic Arctic region is characterised by a relatively large public sector and a higher share of employment in primary production, while the southern parts of the Nordic countries and the main urban centres in particular have a more balanced gender ratio in terms of labour market participation.

Iceland's employment rate is well above the Nordic average, both for males and females across all regions of Iceland. The same is true for the Faroe Islands where up to 95% of the labour force of both genders is employed. The North Atlantic Islands share this characteristic with

Iceland's employment rate is well above the Nordic average, both for males and females across all regions of Iceland. The same is true for the Faroe Islands where up to 95% of the labour force is employed.

Åland which also has a generally high employment rate for both genders.

In the northern and eastern parts of Finland, the female employment rate is higher than that for males, which is not the case for most other parts of the Nordic countries. In these Finnish areas, the male employment rate is generally low. Most of the regions with this characteristic face problems related to industrial restructuring with a significant decline in the importance of so-called 'traditional occupations'.

A number of small communities in the southern part of Norway also have a higher proportion of women in employment than men. Three border regions in Sweden also have higher proportions of women in employment although this is because the men commute across the border to Norway for work and therefore do not appear in the Swedish national labour force statistics.

Commuting between work and home

The employment rate is usually measured from the 'night population', i.e. based on where people live. Since a labour market region is bigger than the municipalities where the people live there are often significant differences between where people live and where they work. Figure 5.4 shows out-commuting people in terms of their share of the working age population (15-64 years). Out-commuting refers to commuting out from an origin municipality, i.e. where the commuters reside, to the receiving municipality, i.e. where the commuters' work place is located. For domestic commuters only out-com-

Visualising commuting

The map in figure 5.4 shows municipal out-commuting flows as a share of the origin municipality's working age population (15-64 years). The origin municipality is the municipality where the commuters reside, while they work (and commute to) the destination municipality. Thus, the map does not show commuting in absolute numbers, but instead which municipalities have the largest shares of commuting (in relation to their working age population, i.e. people aged 15-64 years). One could say that this map gives the perspective of the out-commuting municipalities rather than that of the in-commuting municipalities, and takes into account the (working) population size of the included municipalities.

There is clearly a challenge here in presenting commuter flows in map form, as the map should remain readable and not too blurry. It is for this reason that the capital regions, where much of the most intense commuting take place, are presented in separate maps. In order to limit the amount of commuter flows shown in the map, a threshold was set to 6% for domestic commuting, i.e. for commuting between municipalities within a country, only out-commuting shares above 6% have been included in the map. Regarding commuting between municipalities across national borders, the commuting flows are relatively limited when compared to the largest domestic commuting flows, but are still distinct in some areas, e.g. the Värmland-Oslo region, and the Öresund region. Thus, for municipal commuting across national borders, the threshold for out-commuting shares has been set to 1%. Furthermore, due to limited data availability, only international municipal commuting between Denmark and Sweden has been included in this map (see the two folded maps in the upper left corner).

muting shares above 6% have been included in the map, while for commuting between countries, only out-commuting shares above 1% have been included (applies to Denmark-Sweden and Norway-Sweden only; see the two small maps in upper left corner). The capital regions are presented in separate boxes.

Major municipal out-commuting flows in 2013

Out-commuting as share of the origin municipality's working age population (15-64 years)



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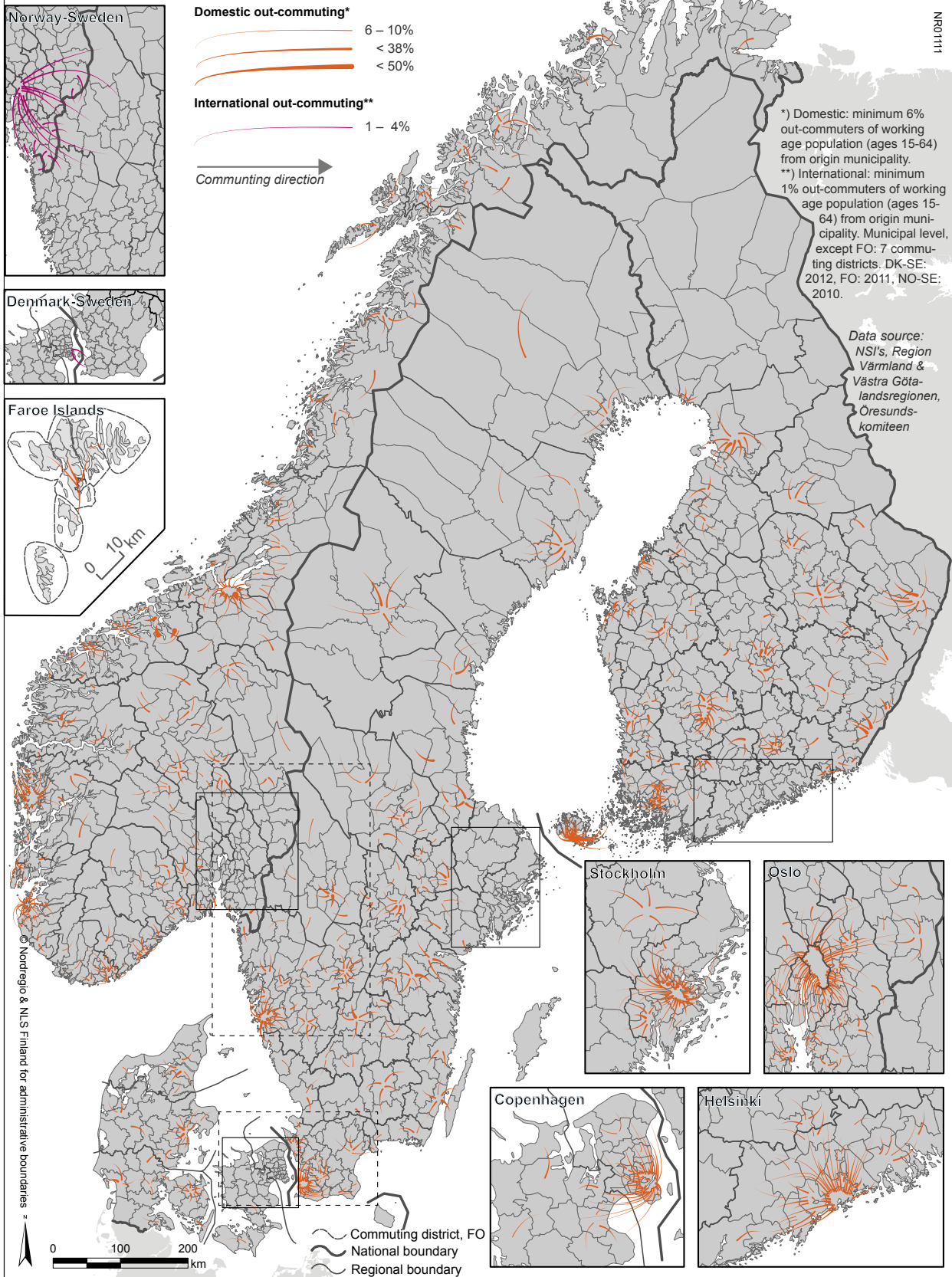
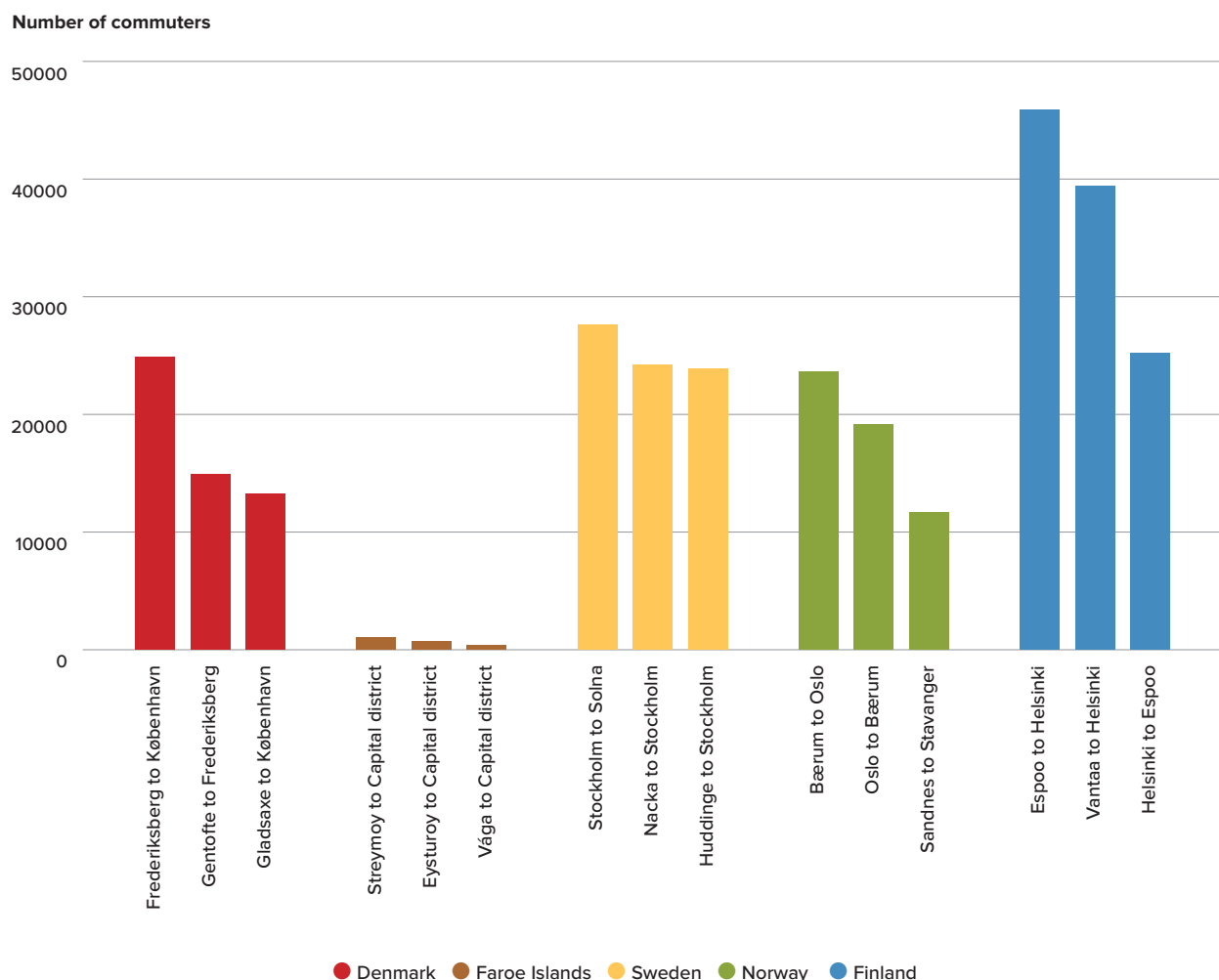


Figure 5.4: Major municipal out-commuting flows in 2013. Note: Greenland and Iceland: No data

Figure 5.5: The three largest municipal out-commuting flows in Denmark, the Faroe Islands, Sweden, Norway and Finland in 2013



Data source: NSI's. Note: Faroe Islands: commuting districts, 2011. Finland: Includes Åland. Greenland and Iceland: No data

The dominant commuting flows are understandably directed to the capital municipalities. Large flows can also however be viewed in the direction of a number of municipalities located in the proximity of the Nordic capital cities where many employers are located, e.g. Solna in Stockholm region, Espoo in Helsinki region, Frederiksberg in Copenhagen region and Bærum in Oslo region. There are also large commuting flows from municipalities located around various other metropolitan municipalities, e.g. Århus and Odense in Denmark, Stavanger, Bergen and Trondheim in Norway, Malmö and Göteborg in Sweden and Turku and Tampere in Finland.

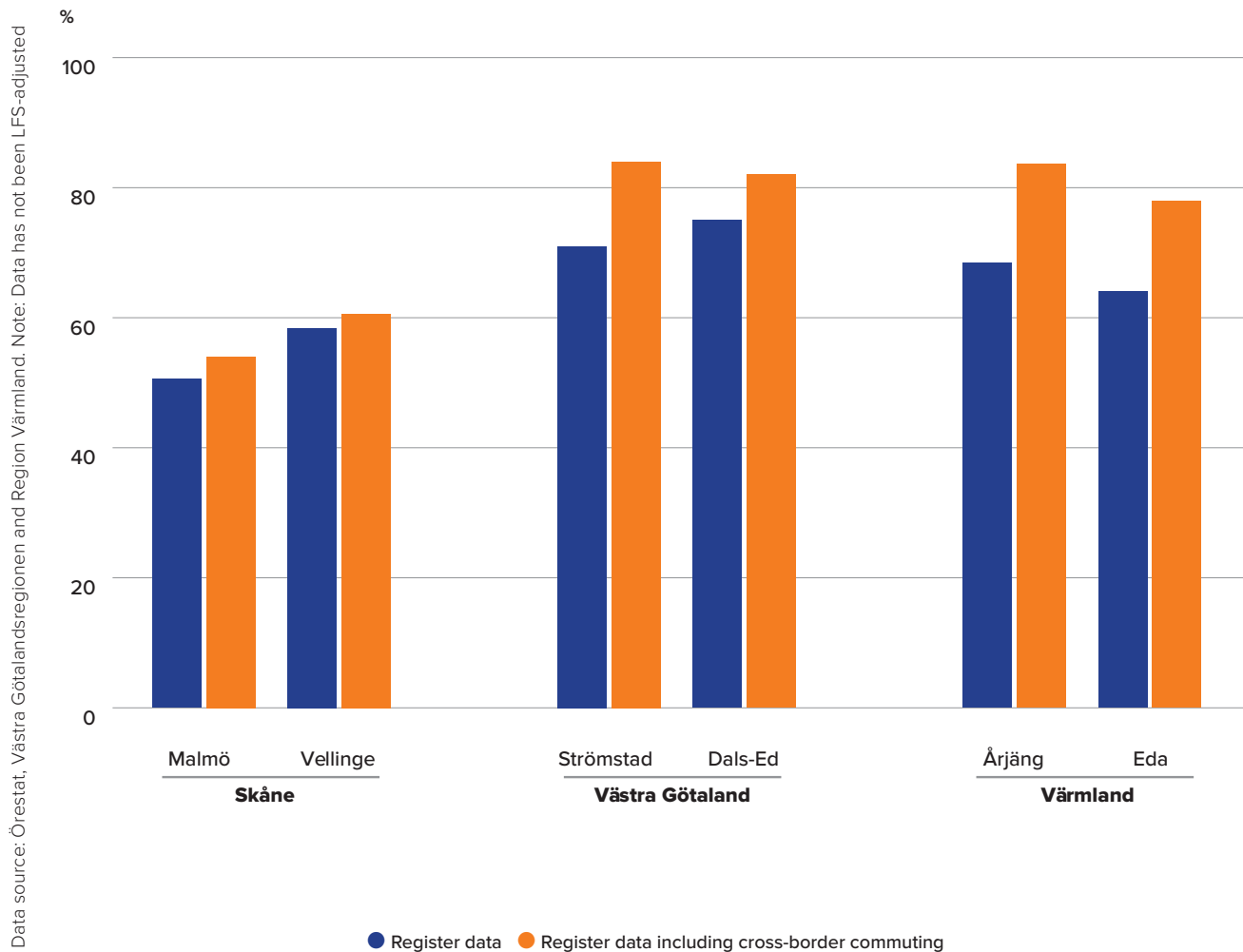
Åland, although it has quite a small total population, has many municipalities, intense commuting patterns between the municipalities, similar to the larger metropolitan regions. The commuter flow is generally directed towards Mariehamn, the main urban center. In the Faroe

Islands, only two out of seven commuting districts do not have out-commuting flows to the capital district (Tórshavn and suburban settlements) above 6%, i.e. Suduroyar and Nordoya. Suduroyar is, in fact, the only commuting district without an out-commuting flow above 6% (due to its remoteness from Tórshavn, the main labour market). Inland northern Sweden and Finland generally have a sparsity of out-commuting flows above 6%, but some rather major ones do still exist, in Sweden to Östersund, Umeå and Luleå and in Finland to Oulu and Vaasa.

As can be seen in figure 5.5 the three largest municipal out-commuting flows, per country, in absolute terms can all, with the exception of Sandnes to Stavanger, be found in the capital cities, with the biggest flows between the populous municipalities in the Helsinki region.

In general, cross-border commuting is rather limited compared to commuting within the Nordic coun-

Figure 5.6: Employment rates in 2012 for selected Swedish municipalities



The big commuting flows go from Sweden to Norway and Denmark whereas commuting from Norway and Denmark to Sweden remains small in volume terms.

tries. There are however some exceptions, in particular in the Värmland, Västra Götaland and Öresund regions. In these regions cross-border commuting is of some importance. The big commuting flows go from Sweden to Norway and Denmark whereas commuting from Norway and Denmark to Sweden remains small in volume terms.

Since the national statistics on employment do not take cross-border commuting into consideration, employment rates for these border regions are usually reported as lower than they would be if cross-border commuting were included. Figure 5.6 shows the difference in the employment rate for selected Swedish municipalities if cross-border commuting is included. As can be seen here, some municipalities would have a significantly higher employment rate if cross-border commuting was added into the calculations.

Chapter 6

UNEMPLOYMENT:

Young people pay the price for an incomplete recovery

Authors: **Anna Karlsdóttir** and **Gustaf Norlén**
 Maps and data: **Gustaf Norlén**

In terms of unemployment the Nordic Region has several distinctive development trends. The unemployment rate is very low in the North Atlantic regions, Iceland, Faroe Islands and Norway. On the other hand, Sweden and Finland are still experiencing a high unemployment rate in some areas particularly in the northernmost regions. Some urban and metropolitan regions are also witnessing high unemployment rates among their more vulnerable and immigrant populations, as is the case in Denmark. The youth unemployment rate is likely also to be on the rise across much of the Nordic Region.

In this chapter we describe unemployment development in the Nordic Region in a European context and thereafter describe the main challenges for each of the Nordic countries in terms of unemployment. We will focus on the youth segment of the population in particular as a vulnerable group, especially Finland, Sweden and to some extent also in Norway, given that across the Nordic Region as well as globally, the proportion of youth currently without work or not involved in either education or training is growing. The terms on which people get access to the labour market may need to be reconsidered to prevent a lost generation, especially in Finland.

Nordic unemployment low in a European context

The countries along the EU's southern and eastern borders are suffering from the highest levels of unemployment, i.e. the southern part of the Mediterranean region, the south-eastern part of the Baltic Sea Region, the central-eastern regions, as well as the north west of Ireland (figure 6.1). At the other end of the scale, large parts of western-central Europe, the oil driven economies of the North Sea (i.e. Scotland and Norway), as well as the

Russian regions around St. Petersburg were facing unemployment rates below 5%, which is well under the EU average of 10.8% in 2013. Compared to the rest of Europe, the Nordic Region has a regionally varied patchwork of unemployment levels across regions, but without the very high levels found in southern and south-eastern parts of the EU.

The average unemployment rate in the Nordic Region was 7.0% in 2014, a bit lower than the European rate of 10.2% for the same year. As shown in figure 6.2, the highest unemployment rates in the Nordic Region are found in northern and eastern Finland as well as in some Swedish municipalities (e.g. Södertälje, Trollhättan, Landskrona, Malmö and Haparanda). All of these have unemployment rates above 14%. Faroe Islands, Iceland and Åland with unemployment rates between 3-5%

Measuring employment and unemployment

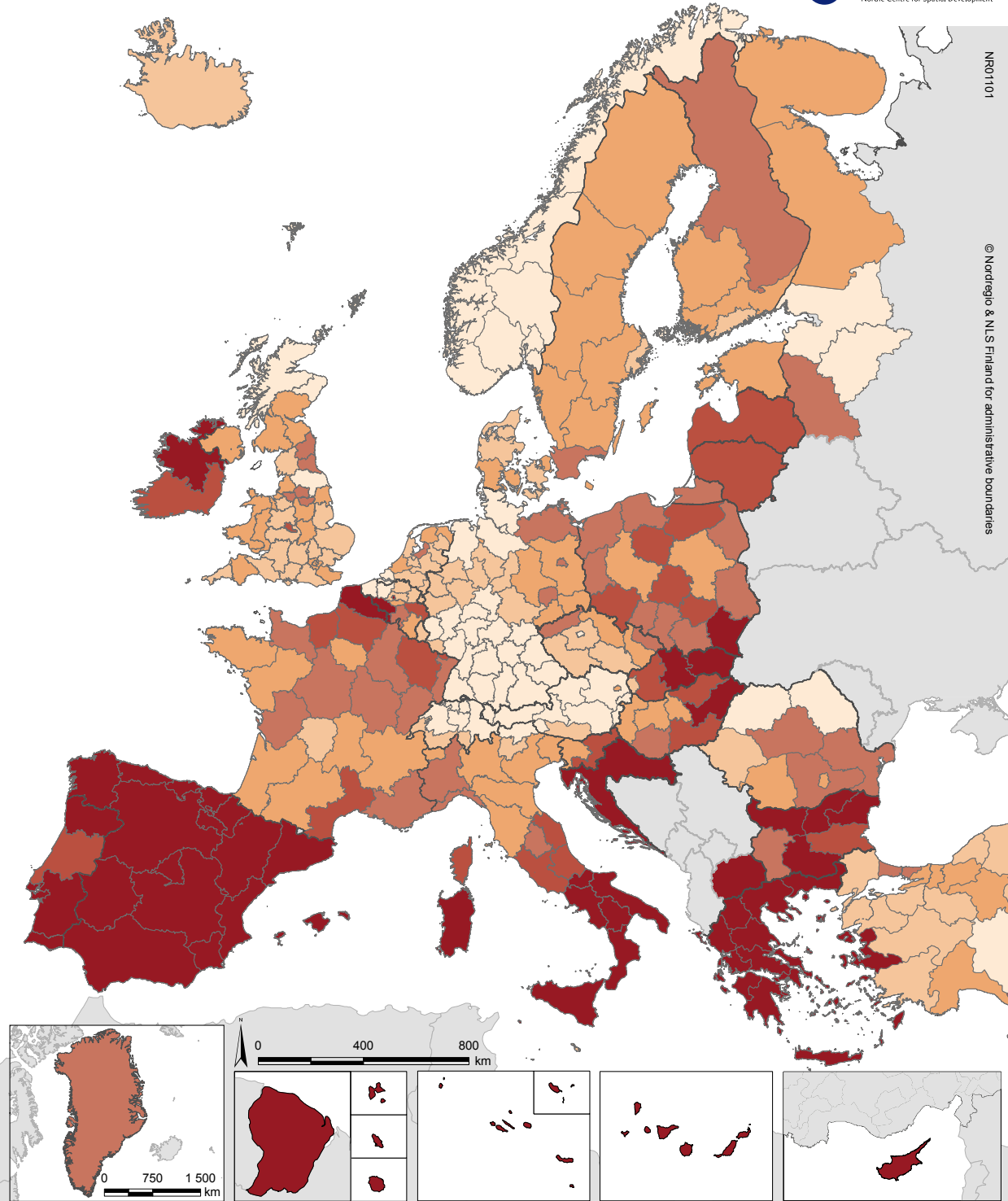
There is a relation between the employment rate and the unemployment rate, but it is not a 1:1 relation. While employment rates are calculated as shares of the total population, the unemployment rate is calculated as a share of the active population, i.e. as a share of the employed plus the unemployed. Hence, unemployment rate does not include the people that are outside the workforce, only those who are actively searching for jobs.

Unemployment rate in 2013



NR01101

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Unemployment rate in 2013: annual average in %. LFS adjusted series

Dark Red	> 13.0
Red	11.0 – 13.0
Dark Orange	9.0 – 11.0
Orange	7.0 – 9.0
Light Orange	5.0 – 7.0
Very Light Orange	< 5.0

EU28 = 10.8

2013 data, except: GL 2012; RU 2011
NUTS2/SNUTS2 regional level, except: HR NUTS1

Data source: Eurostat, NSIs. N.W. Russia:
© ESPON 2014: ESPON BSR-TeMa/Nordregio

Figure 6.1: Unemployment rate in 2013

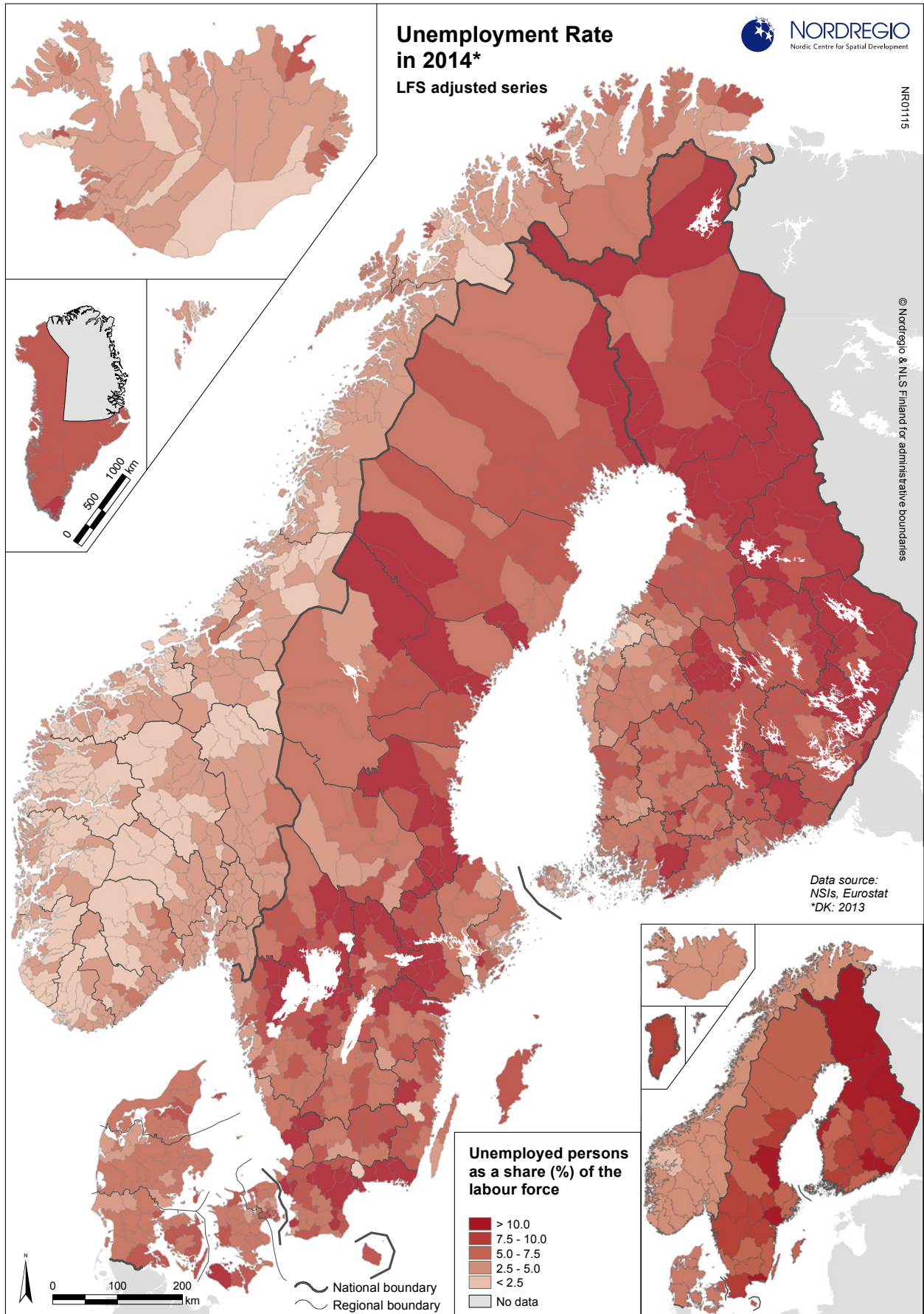


Figure 6.2: Unemployment rate in 2014 – Labour Force Survey adjusted series

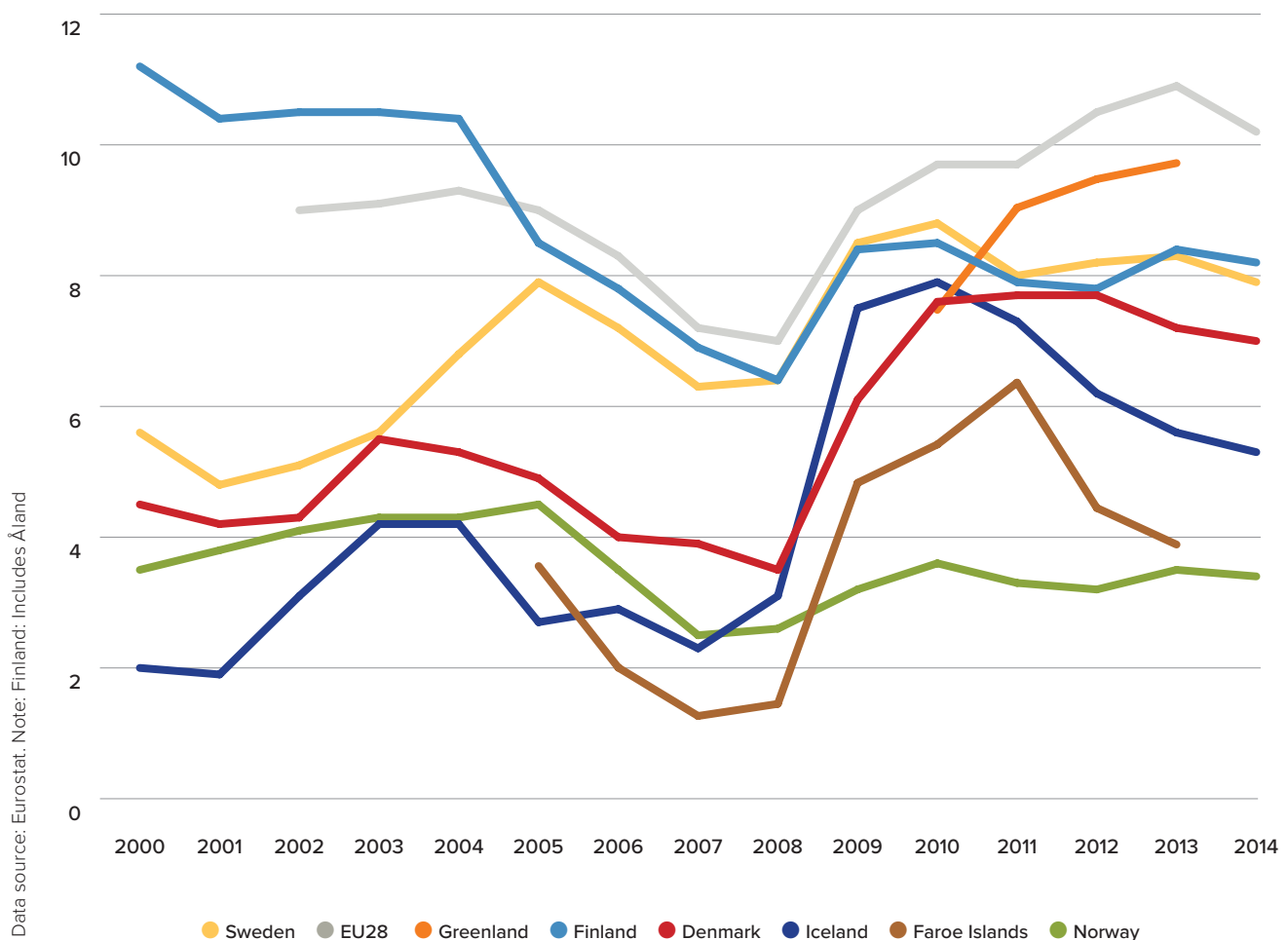
on the other hand have unemployment rates significantly lower than the Nordic average. The unemployment rate in Norway is also low, 3.5% in 2014. The regions with some of the highest unemployment rate – Østfold, Finnmark and Oslo – have an unemployment rate of around 4.5% which is still considerably lower than the Nordic average. The absolutely highest unemployment rates in Norway are found in the very northern municipalities such as Båtsfjord, Vardø and Hasvik in Finnmark and Værøy, Øksnes and Bø in Nordland (all with unemployment rates above 8%). It is also worth noting that many Norwegian municipalities have both a lower employment rate and a lower unemployment rate than e.g. many Swedish municipalities. This shows that there are many people there that are outside the workforce (e.g. Egge 2015).

In Sweden the highest unemployment rates are found in Gävleborg and Blekinge län (both around 11%). Old industrial towns, such as Trollhättan, Södertälje, Sand-

viken and Norrköping also have high unemployment rates (above 12%). The lowest unemployment rates are found in municipalities surrounding the big cities; Ekerö, Vallentuna, Täby, Danderyd and Vaxholm around Stockholm, Knivsta which is close to Uppsala, Lomma close to Malmö and Öckerö, Kungälv, Tjörn and Lerum close to Gothenburg. All of these municipalities have unemployment rates below 4%. This also highlights the issue of segregation in the bigger cities since there are municipalities here with both the lowest and the highest unemployment rates in the same city region.

The pattern of unemployment in Finland is a mirror image of its employment patterns. High unemployment rates are found in the eastern and northern part of the country (above 10%, but in some municipalities, e.g. Pelkosenniemi, Salla and Kemijärvi even above 15%). The Finnish regions of Keski-Pohjanmaa, Uusimaa and Pohjanmaa however have lower unemployment rates than the Nordic average.

Figure 6.3: Total unemployment rate (15-64 years), 2000-2014



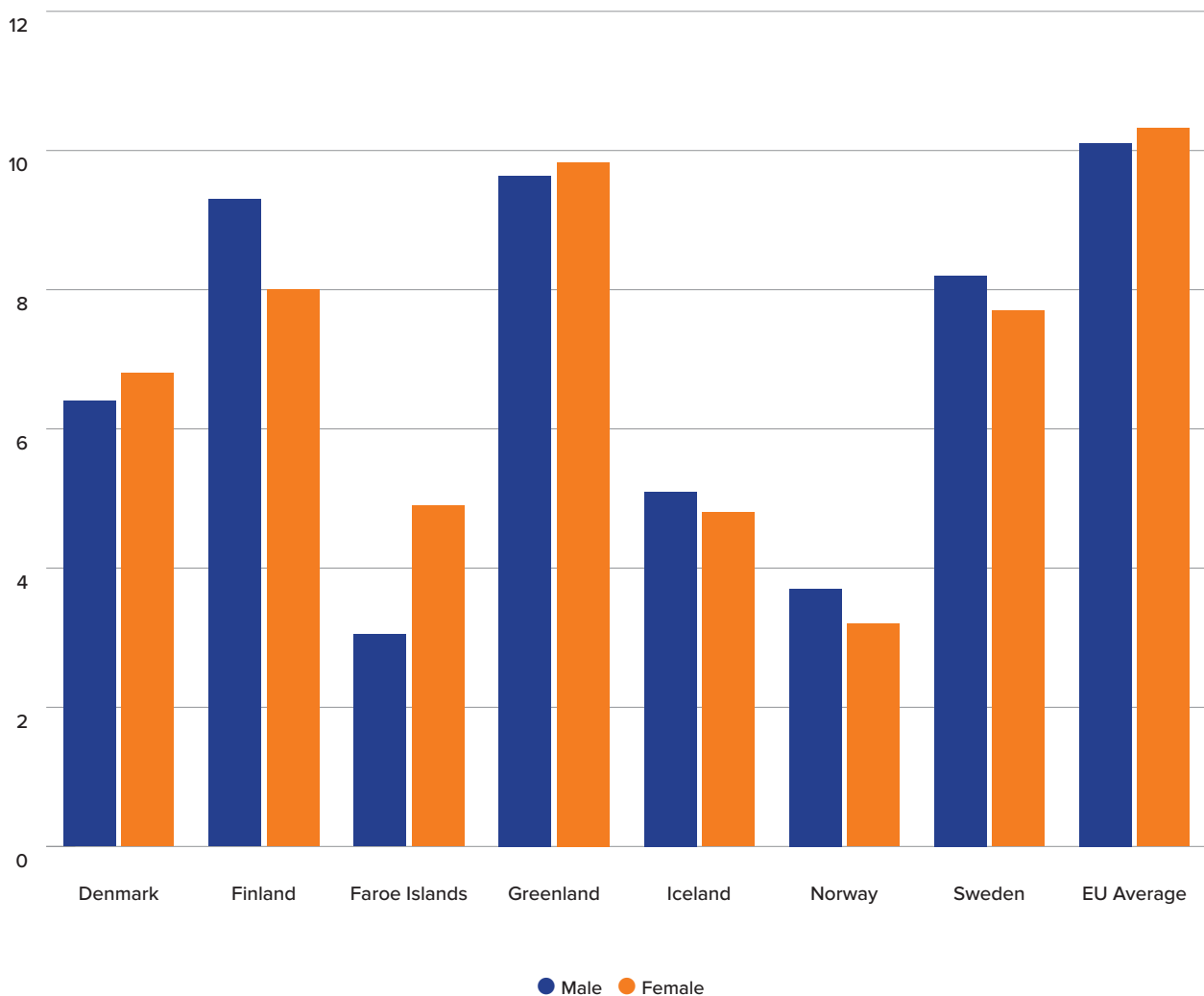
Data source: Eurostat. Note: Finland: Includes Åland

In Denmark four municipalities in Hovestaden – Ishøj, Albertslund, Brøndby, Høje-Taastrup – and Lolland in Sjælland have unemployment rates above 10%. Big cities like Copenhagen and Odense also have rather high unemployment (between 9 and 10%). The regional differences are otherwise smaller in Denmark than in the other Nordic countries and most Danish regions are rather close to the Nordic average.

As a consequence of the economic crisis, the unemployment rate for the Nordic population in working age (15-64 years) did increase sharply across several Nordic nations after 2008, especially in Denmark, the Faroe Islands, Greenland and Iceland (figure 6.3). As we can see from figure 6.3, the pace of recovery also varied, with some countries seeing unemployment decrease faster than others. This is true for Denmark after 2012 and even more so for Iceland after 2010 and the Faroe Islands

As a consequence of the economic crisis, the unemployment rate for the Nordic population in working age did increase sharply across several Nordic nations after 2008.

Figure 6.4: Unemployment Rates, Male/Female in 2014



after 2011. The Norwegian unemployment rate has been low and rather stable since the crisis, with only a limited increase between 2007 and 2010. This renders it as quite distinct from the other Nordic countries, while in Sweden and Finland the unemployment increased modestly between 2008 and 2010, then slightly decreased between 2010 and 2012 but again increased up to 2013, ending in 2014 with similar persistent levels of unemployment as those of 2009.

In the Nordic Region the average male unemployment rate, at 7.2%, was slightly higher than the female unemployment rate, which was 6.8% in 2014. As illustrated in figure 6.4, male unemployment is highest in Greenland followed by Finland and Sweden. Denmark and Iceland saw a reduction in male unemployment after 2011 while in Sweden, Finland and Norway the rate increased slightly over the same period. As illustrated in figure 6.4, unemployment rates between genders, in 2014, varied most significantly in Faroe Islands and Finland, but in rather different ways. While the unemployment rate among males in Finland is higher than for women, the opposite is true for the Faroe Islands. In the case of the Faroe Islands, men's work-mobility seems to contribute to the higher rate of female unemployment. A significant portion of the labour force in the Faroe Islands work abroad, an arrangement that appears to be taken up almost exclusively by men. The flexibility to travel gives males access to a broader range of employment opportunities than women. Furthermore, as a consequence of the large share of men working abroad, women are often required to take on more responsibility for the family, decreasing their work opportunities (ALS 2016).

Cause for concern in parts of Denmark, Finland and Sweden

Denmark is a rich country with relatively small internal socioeconomic differences compared with many other EU countries. However, the Danish economy was hit relatively hard by the financial crisis, which led to a substantial increase in unemployment, in particular among young people and inhabitants with a non-Danish background. Denmark also continues to face a number of challenges in respect of workforce skill levels. These include a falling proportion of people taking vocational training, a decreasing proportion of people from migrant backgrounds receiving an education (especially male), and a persistently high educational drop-out rate (European Commission 2015). The Danish regions most affected by unemployment among males are Albertslund and Ishøj in the Copenhagen metropolitan region and Lolland in the south of Sjælland. There is also an interesting gendered aspect to employment and

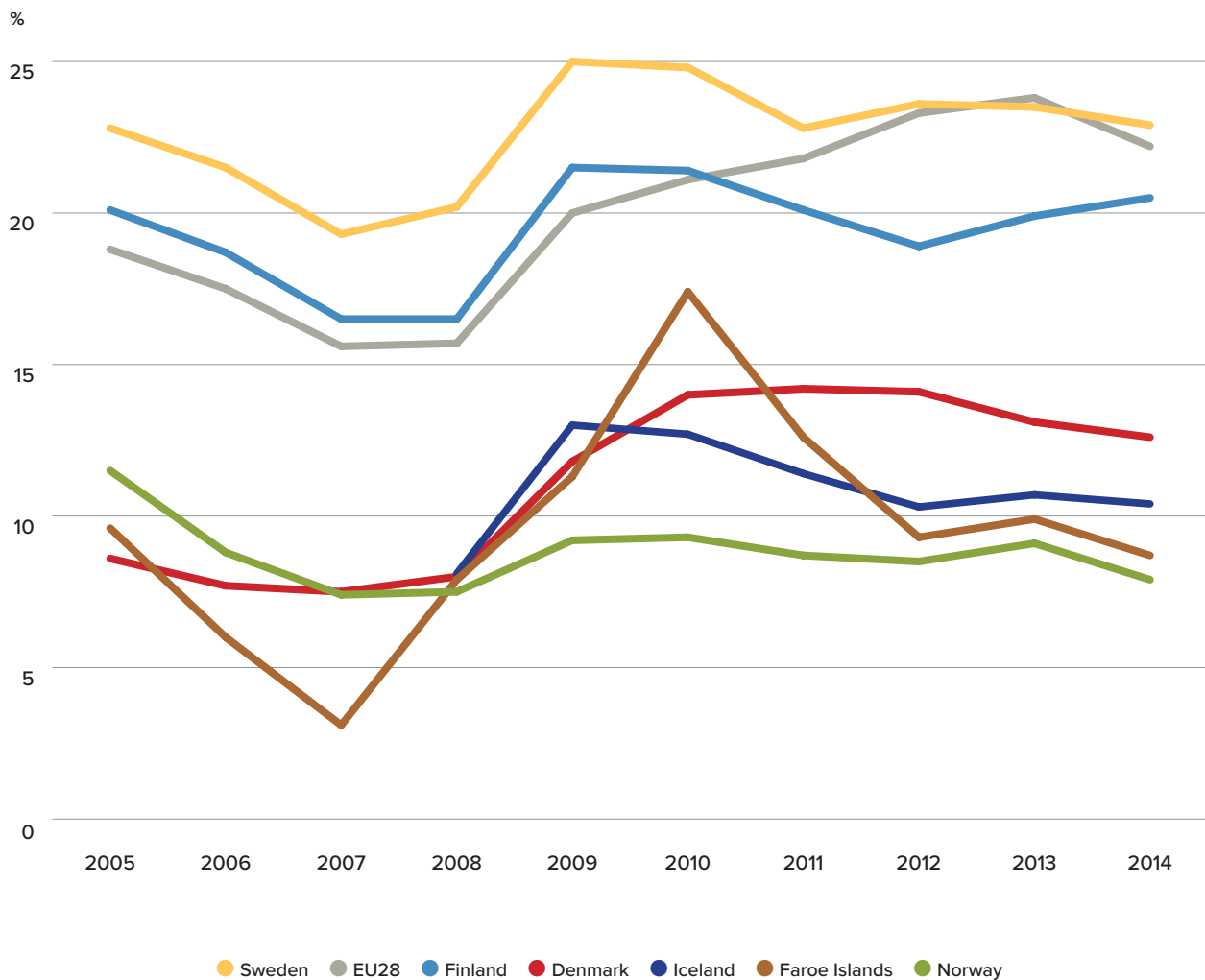
unemployment in Denmark, in the sense, that female unemployment primarily relates to the main urban centre. Of the 26 municipalities in the Capital region of Copenhagen, 12 have higher female unemployment rates than the average of 6.9% in 2013. Moreover, some of them e.g. Albertslund, Høje Tåstrup and Ishøj have a female unemployment rate between 11 and 15%. In general, unemployment rates are higher among women than men in Denmark. The population group that features most prominently in terms of unemployment rates in the Capital region and Sjælland is, women born abroad; their unemployment rate is 26-28% which is far above average rates for 2014.

In Finland the unemployment rate was 8.7% in 2014 and is rising, particularly among young people and older workers. Another challenge for Finland is the weakening balance of public finances and the threat posed by demographic trends to their long-term sustainability. In some municipalities in Finland male unemployment is between 16 and 22% (Salla, Kemijärvi, Pelkosenniemi and Enontekiö in Lappi, Puolanka, Suomussalmi, Paltamo and Kuhmoin Kainuu) while Juuka in Pohjois-Karjala holds the dubious record of having a 21% unemployment rate among male inhabitants. In many of the regions with high unemployment for males there is also a correspondingly high female unemployment rate. Municipalities with over 12% female unemployment in 2014 were; Kemi, Simo and Savukoski in Lapland; Kotka in Kymenlaakso; Kuhmo and Suomussalmi in Kainuu; Kitee and Enonkoski in Etälä-Savo; Lahti in Päijät-Häme and Tohmajärvi in Pohjois-Karjala. Many of these areas share experiences of the challenges associated with industrial restructuring.

According to the Swedish government, GDP and employment have been boosted by growing domestic demand. However due to the growing size of the labour

In the Nordic Region the average male unemployment rate, at 7.2%, was slightly higher than the female unemployment rate, which was 6.8% in 2014.

Figure 6.5: Youth unemployment rate (15-24 years), 2005-2014



Data source: Eurostat. Finland: Includes Åland. Faroe Islands and Greenland: No data

force, unemployment has stayed at around 8% for several years (European Commission 2015). Municipalities with over 13% and up to 17% male unemployment in 2014 were Södertälje in Stockholm region, Eskilstuna in Södermanland, Lessebo in Kronoberg, Ronneby in Blekinge, Perstorp, Malmö and Landskrona in Skåne, Storfors and Filipstad in Värmland, Ljusnarsberg in Örebro, Trollhättan and Åmål in Västra Götaland, Fagersta in Västmanland and Haparanda in Norrbotten. As in Finland, some of the municipalities with high male unemployment rates also have correspondingly high female unemployment rates. This e.g. applies to Storfors, Landskrona, Trollhättan, Eskilstuna and Södertälje. In both Sweden and Finland, inner peripheries and coastal peripheries have the highest youth unemployment rates. The continuing challenge facing the

One of the major knock-on effects of the financial crisis in 2008 is rising youth (ages 15-24) unemployment across Europe.

Swedish labour market then is the need to integrate the large number of economically and socially vulnerable persons currently without work. The regions with the highest unemployment rates also have high percentages of immigrants and socially vulnerable persons (European Commission 2015).

Youth unemployment at alarming levels

One of the major knock-on effects of the financial crisis in 2008 is rising youth (ages 15-24) unemployment across Europe. As shown in figure 6.5 the youth unemployment increased in all of the Nordic countries during the financial crisis and has remained on a fairly high level since. In 2013 the average European youth unemployment level was 23.8%, although it was slightly lower for the Nordic Region, at 17.2%.

The group aged 15-24 is usually preoccupied with education. As such, unemployment statistics mainly reflect the lives of the most vulnerable group of adolescents, i.e. the share of adults which is entirely new to, or about to enter, the labour market. It is also the case that in response to the tightening of the labour market, the length of time spent in education has, in many cases, been extended. As such, young people across the Nordic Region now spend more of their life in education or training than did previous generations. The need for formal qualifications contributes to this, and as the labour market requirements for experienced labour increases, different forms of trainee or even voluntary arrangements become part of the 'entrance ticket' into the formal world of work. As a result, it takes longer for young people to become full participants in the labour market.

As seen in figure 6.6 some regions and municipalities had notably higher youth unemployment rates than the EU28 average of 23.8% in 2013. Some regions in Sweden in particular have high youth unemployment, e.g. Blekinge, Gävleborg, Gotland and Södermanland, all with youth unemployment rate of around 30%. According to Statistics Sweden (SCB) one reason for this is that the systems of apprenticeship differ between the Nordic countries. In the Labour Force Survey (LFS) series apprentices with a salary are considered to be employed. In Sweden there have been very few apprentices (under 1%) whereas in countries such as Germany and Austria almost 25% of students are apprentices. A system with many apprentices' means that fewer are considered unemployed and that the quantity of the labour force increases. Since unemployment is a ratio this affects the unemployment rate in two ways.

Another explanation relates to the system of subsidies for students. In Sweden and Finland, both countries

The youth unemployment rate is generally higher for men than for women; the Nordic average for men was 18.9 % while it was 15.6 % for women in 2013.

with high youth unemployment rates, student subsidies are not given in the summer. This increases the incentive for students to become job seekers and thus results in more students being registered as unemployed than would otherwise be the case. Labour force survey statistics counts full time students that are looking for work as unemployed. A youth unemployment rate of 25% does not mean that every fourth youth is unemployed. Rather that 25% of the potential labour force is unemployed. In 2011 more than half of all students in Sweden were part of the labour force, the rest were students that were not looking for jobs (SCB 2016).

Three of the micro economies in the Nordic Region, Iceland, Åland and, in particular, the Faroe Islands, do not face challenges in terms of youth unemployment, with generally low levels, but Greenland is challenged by higher rates of youth unemployment, up to 22%, which is the case in Kujalleq (South Greenland).

The youth unemployment rate is generally higher for men than for women; the Nordic average for men was 18.9 % while it was 15.6 % for women in 2013. The biggest differences between male and female youth unemployment is found in the Finnish regions Keski-Suomi, Etelä-Pohjanmaa and Pohjanmaa, as well as in some regions in the North of Sweden such as Västernorrland and Jämtland. All these regions have significantly higher male youth unemployment.

Persistent or long-term unemployment among young people is a concern in some of the Nordic countries. Additionally the share of young people (aged 15-29) that are neither in employment, nor in education or training (commonly abbreviated as "NEET") has risen internationally, in 30 out of 40 countries for which data is available between 2007 and 2012 (ILO 2014). High and/or rising NEET rates are a major concern for policy makers,

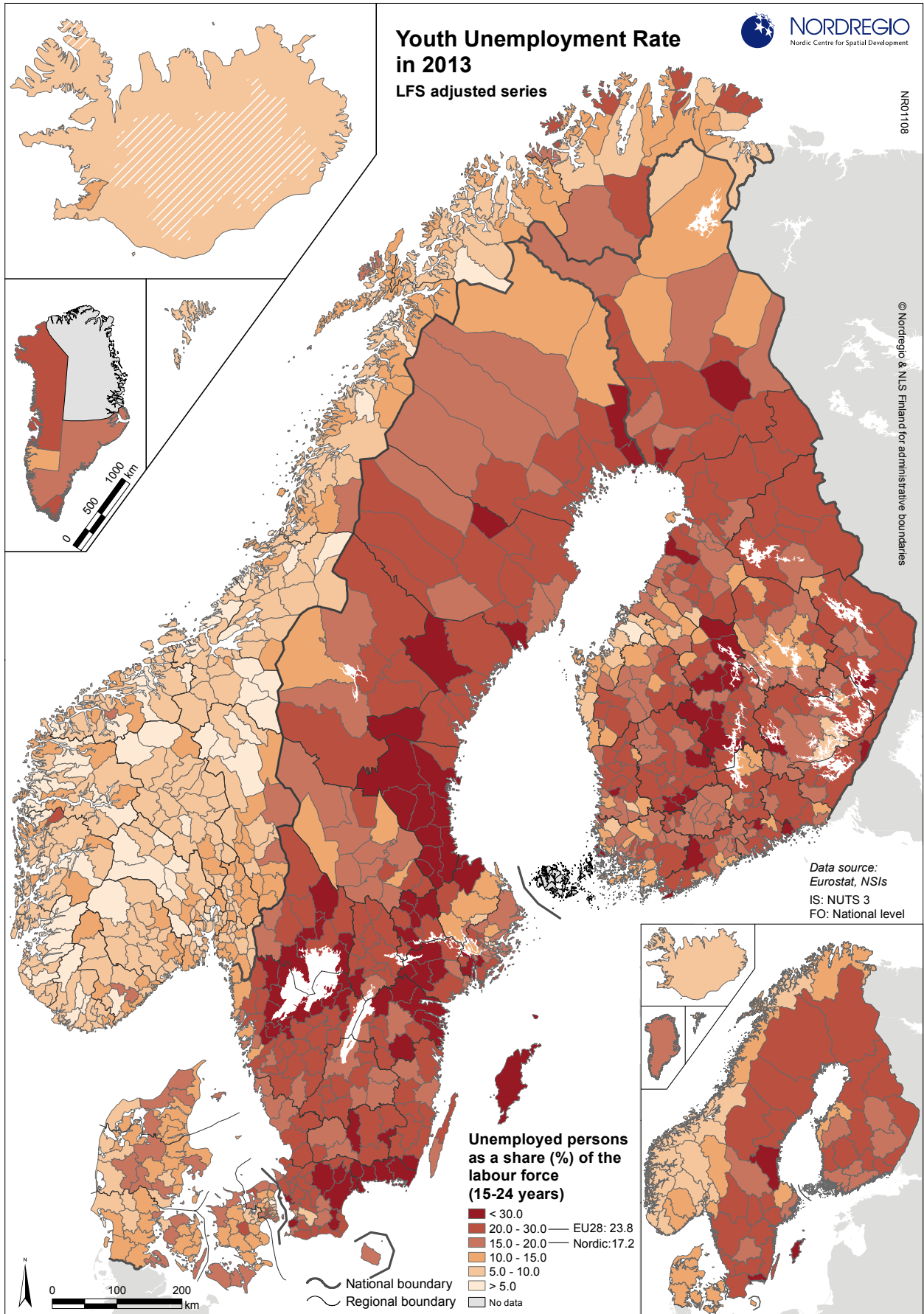


Figure 6.6: Youth unemployment rate in 2013 – Labour Force Survey adjusted series.

as this group is neither engaged in employment, nor investing in skills development. Moreover, young people that are among the NEET group may be less engaged and more dissatisfied with their societies than their peers who are employed or in the education system.

This has for example been a challenge in Norway. Norway has a low youth unemployment rate but still many young people that neither are a part of the workforce nor engaged in education. Norwegian authorities have started to pay attention to this group coining it “Nave” (Egge 2015). Swedish social authorities have also for a while focused on this marginalised group from the perspective of mental disabilities or dysfunctionalities (Socialstyrelsen 2013). From a regional welfare perspective, the regional labour market policies response to ageing and shrinking regions should obviously be to focus on the talents and potentials of young people, however there are indications that labour market policies, e.g. in Sweden addressing consequences of ageing fail to include young adults and the policies do not address regional heterogeneity in respect of e.g. ageing and youth unemployment (Rauhut and Kahila 2012). Globally, the labour market for the NEET group has worsened, posing significant challenges in the years ahead in terms of reconsidering employability (ILO 2014).

In Norway many young Swedes have been given opportunities to gain work experience in recent years. There is a complementarity principle between neighbour countries that calms pressures on unemployment insurance systems.

Denmark has for a number of years had as its top priority in terms of labour market and social policy issues, to recruit young long term unemployed into jobs or educational options (Norden 2010). In 2013 the highest youth unemployment in Denmark was to be found in the various municipalities across the Capital Region (on average 14.5%), with Halsnæs municipality facing the highest rate of 28.7%. The most vulnerable group in the age group 15-24 years experiences a hugely marginalised role, without education, without job or any training experience (Halvorsen et.al 2012).

In Norway many young Swedes have been given opportunities to gain work experience in recent years. There is a complementarity principle between neighbour countries that calms pressures on unemployment insurance systems, when flows of workers between the Scandinavian countries, engage in employment-related mobility.

The youth unemployment in Finland varies across regions but is high in many municipalities and in some cases exceeds the alarming levels that have been associated with Southern Europe. This applies to municipalities with unemployment rates higher than 32% and up to 45% such as Rautjärvi in Etelä-Karjala, Pyhtää in Kymenlaakso, Pätäjävesi and Jämsä in Keski-Suomi, Orivesi and Akaa in Pirkanmaa, Kemi and Kemijärvi in Lapland, Kustavi in Varsinais-Suomi and Hanko in Uusimaa. Strategies to reduce this alarmingly high youth unemployment rate and mobilise the youth segment of society are thus desperately required in order to ensure that a lost generation is not created.

Concluding comments

In this overview of development trends in respect of unemployment in the Nordic Region we have shown, supported by statistical data, how unemployment levels vary between regions. Some of the Nordic countries are experiencing generally high and persistent unemployment levels among their immigrant and socially vulnerable population that is living in the capital and urban regions. Meanwhile others are dealing with high unemployment levels in rather more rural and remote regions, where ageing and regional shrinking, due to demographic changes and industrial restructuring, is prevalent. Countries within the Nordic Region are also recovering, at varying rates, from plummeting employment levels due to the financial crisis and the recession that followed in 2008. The group of so-called NEETS has increased across the Nordic countries since 2007. This group remains of major concern for policy makers as the individuals concerned are neither engaged in employment, nor investing in skills development. Regional labour market policies will thus have to address the issue of employability more seriously.

Chapter 7

EDUCATION: Strong performance but alarming regional fluctuation

Author: **Linus Rispling, Gustaf Norlén** and **Liisa Perjo**
 Maps and data: **Linus Rispling** and **Gustaf Norlén**

Education and skills levels clearly play an important role in social and labour market policy and this is also true for regional development. Positive economic development within a region depends on its access to a population pool with right types of education and skills.

In general, the Nordic countries are doing well when it comes to education-related indicators, but regional variations remain. This chapter presents the current situation in the Nordic countries from the Nordic Regions level while, in addition, also providing an international comparison, including a reference to the EU's Europe 2020 education targets. In order to provide a snapshot of the most important issues related to education at different levels, the chapter presents a suite of statistics ranging from compulsory education to doctoral education and life-long learning in the form of distance learning.

Nordics remain top of PISA table but are losing their lead

The Programme for International Student Assessment (PISA) is an international survey that is made by the OECD every three years. The aim of the assessment is to evaluate education systems by testing the skills and knowledge of 15-year-old students. Around 510 000 students from 65 countries took part in the PISA 2012 assessment and they represented, in total, 28 million 15-year olds. The goal of the PISA survey is to enable countries to compare their students' performance over time and assess the impact of education policy decisions. Although the PISA assessment approach has been criticised, it remains a widely used tool to assess education systems around the world.

In the PISA 2012 survey, the results of the Nordic countries were, in general, close to the OECD average, but some clear patterns are discernible as illustrated by

In the PISA 2012 survey, the results of the Nordic countries were, in general, close to the OECD average.

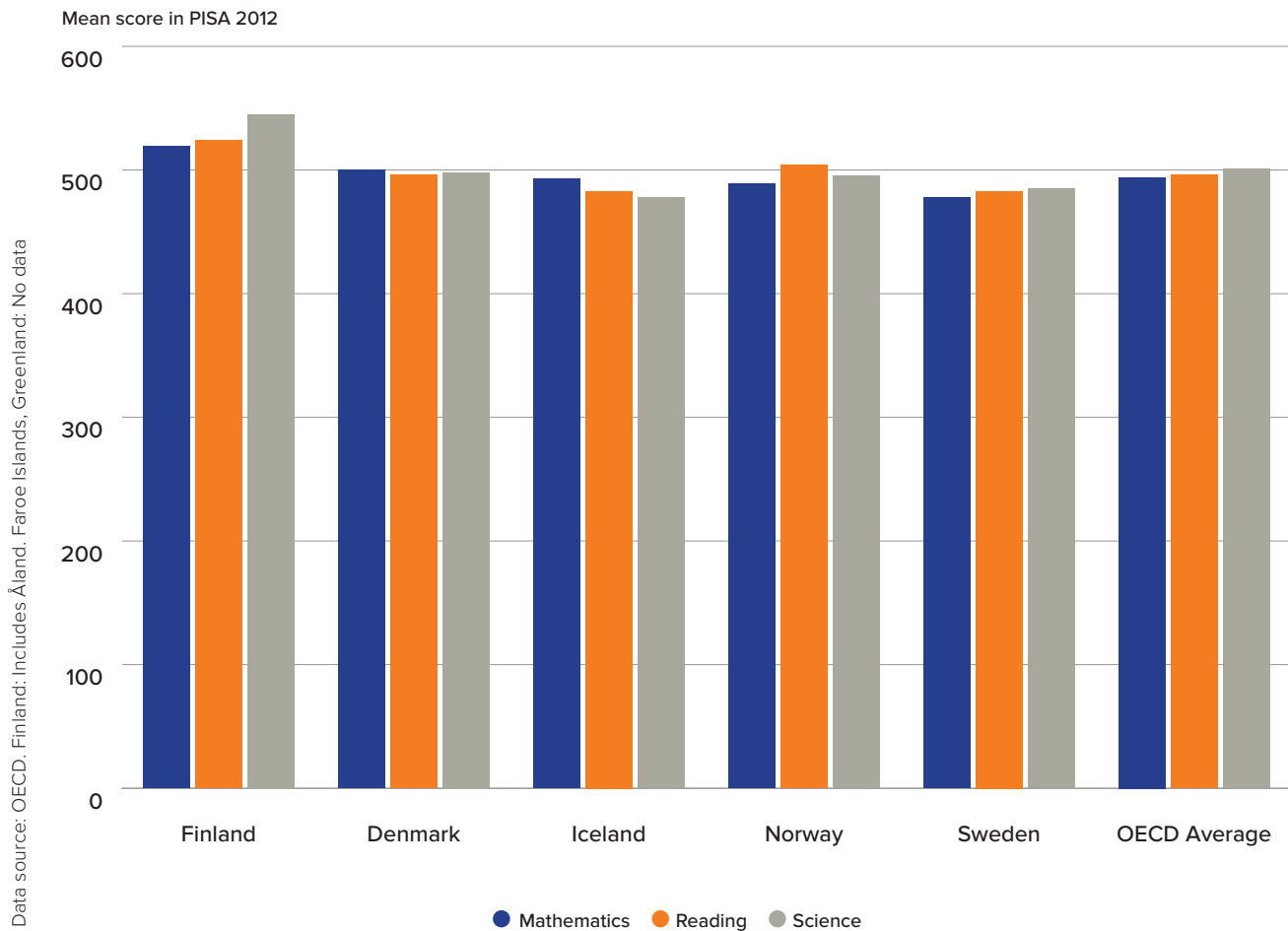
figures 7.1 and 7.2. Finland in particular stands out as a higher performer than the rest of the Nordic Region.

Since the first PISA report in 2000 Finland has been a top achiever. Its results have however declined in the last two reports (2009 and 2012), but they still remain top in a Nordic context (figure 7.2). All of the Nordic countries have seen a decline in their scores since 2003, although for Norway this decline has been small and not statistically significant. Sweden however is the OECD country that has seen the biggest negative change since 2003 and is now scoring below the OECD average; this is especially true when it comes to mathematics (OECD 2015).

Regional variation apparent in rates of early school leaving

Analysing the share of early school leavers can provide an indication of the challenges to be met in the Nordic Regions. A high share of early school leavers may, among other things, point to the likely future challenges in skills-provision for regions where the young population lack upper-secondary school level skills and thus the possibility to attend universities and colleges. The share of early school leavers is also a central indicator

Figure 7.1: PISA results in 2012

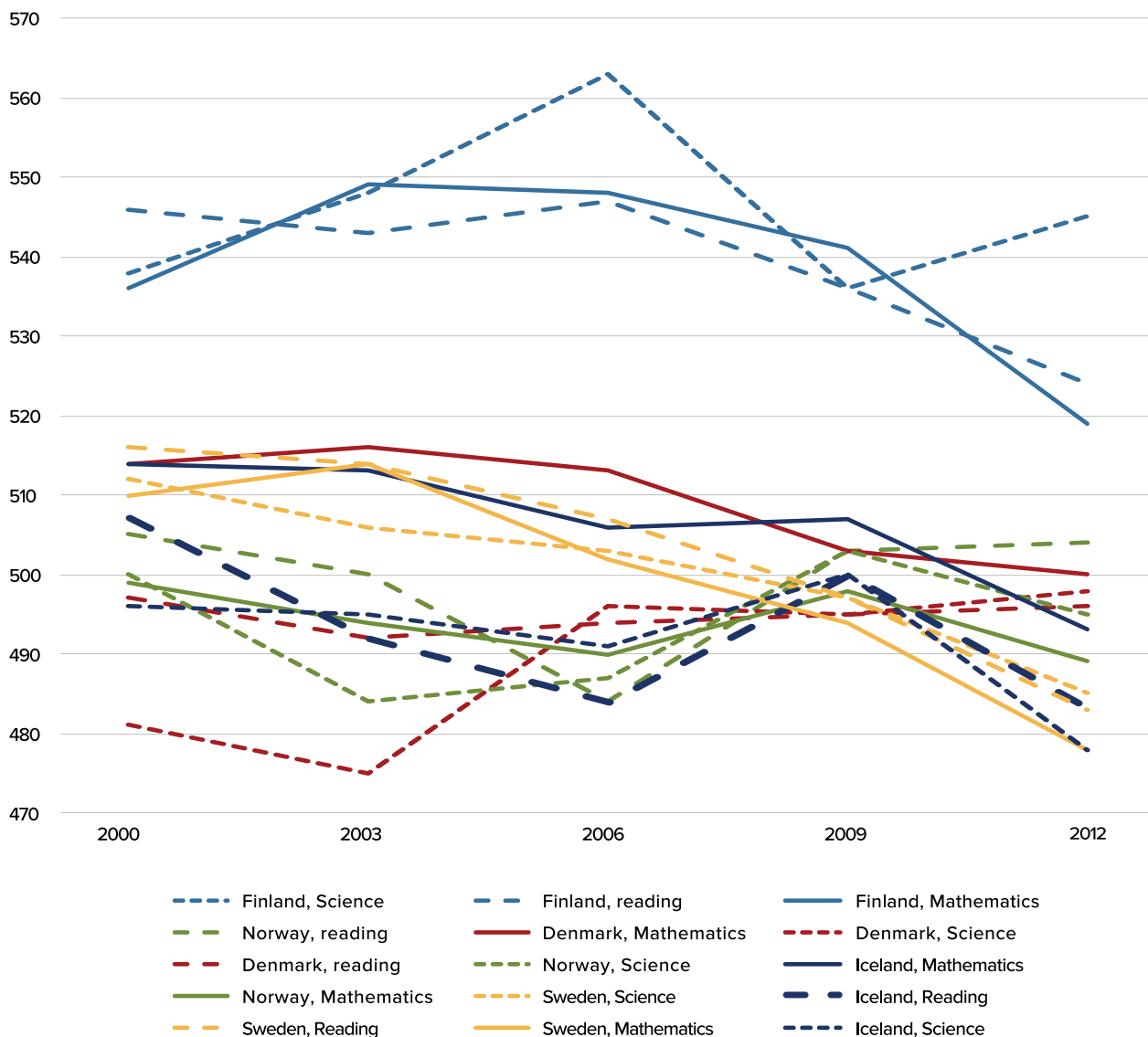


in the EU 2020 strategy as a high level of early school leavers may influence societal development in a variety of ways. The map in figure 7.3 shows the share of early school leavers in Nordic Regions among persons in their early twenties, i.e. the share of persons aged 18-24 years who, at best, have only attained a lower secondary education, and are not involved in further education or training. Early school leavers are defined as those who have not moved on from the compulsory lower secondary school to upper secondary school, i.e. what in Danish and Swedish is called *gymnasium*, in Finnish *lukio* (complemented by vocational education, *ammattillinen oppilaitos*), in Norwegian *videregående skole*, and in Icelandic *framhaldsskóli*. With a narrow age selection of 18-24 years, the indicator captures people who, by this age, would recently have finalised their lower secondary education, and should also have started or finalised the upper-secondary level – had they attended upper-secondary school.

The European Commission has included early school leavers as one of the Europe 2020 headline indicators, as numerous linkages exist between giving up school

The Europe 2020 target is early school leaving rates of below 10%

and a range of factors important for the development of the society, such as unemployment, social exclusion and poverty. The Europe 2020 target for this indicator is that rates of early school leaving should be below 10% (EU Commission 2015a). As displayed in figure 7.3, in several parts of the Nordic Region this 10% target has already been reached. The light-yellow hues in the map indicate values on the positive side of the threshold, i.e. below 10%, and these can be found in all Danish and Swedish regions, and in some Finnish and Norwegian regions. At

Figure 7.2: PISA results 2000-2012

Data source: OECD. Finland: Includes Åland. Faroe Islands, Greenland: No data

the national level, Norway, Iceland, and the non-EU Faroe Islands and Greenland have not, as of 2014, fallen below the Europe 2020 target of 10%, which is the case with Sweden (6.7%), Denmark (7.7%) and Finland (9.5%). In the EU as a whole, 19 of the 28 member states had already, as of 2012, scored below the 10% target (Eurostat 2015a).

Figure 7.3 shows the share of early school leavers on the NUTS 2 (definition in the Introduction chapter) level. This includes areas that are larger than the regional standard divisions in Finland, Norway and Sweden. It indicates some interesting variations within the Nordic Regions. In Danish regions, the share of early school leavers varies between 7% and 9%, i.e. below the Europe 2020 threshold. In Norway, Oslo og Akershus and Vest-

landet are the only two NUTS 2 regions (landsdel) below the 10% threshold, with rates around 9%. Also, despite the public debate in Sweden on pupils not finalising the lower secondary school, the Swedish regions have among the lowest shares of early school leavers in the Nordic countries. Six out of eight Swedish NUTS 2 regions (rikssområden) have a share of early school leavers below 7%, while Hovedstaden in Denmark is the only other Nordic Region with a similar rate. In Finland, variations between the NUTS 2 regions (suuralue/storområde) are bigger than in Sweden and Denmark and more similar to the regional variation within Norway. In Åland, the share of early school leavers is estimated to be 11%, but Åland students enrolled in studies in neighbouring

Despite the public debate in Sweden on pupils not finalising the lower secondary school, the Swedish regions have among the lowest shares of early school leavers in the Nordic countries.

Sweden are not included in this figure and therefore the true figure is probably smaller.

Perhaps the most striking feature in respect of early school leaver rates is the high rate of early school leavers in the Faroe Islands, Greenland, Iceland and northern Norway, all of which are above 15%. With the exception of northern Norway, these regions have a gender distribution among early school leavers which is unfavourable for men; as indicated in the pie charts, males generally predominate among early school leavers in these regions. This can probably be explained with reference to the regional economic structure as these areas have largely resource-based economies with little incentive, particularly for men, to delay earning in order to continue education.

Looking at the broader picture, the fact that males in many Nordic Regions predominate among early school leavers follows the trend and average of the 28 EU countries (figure 7.3). Generally, the higher the early school

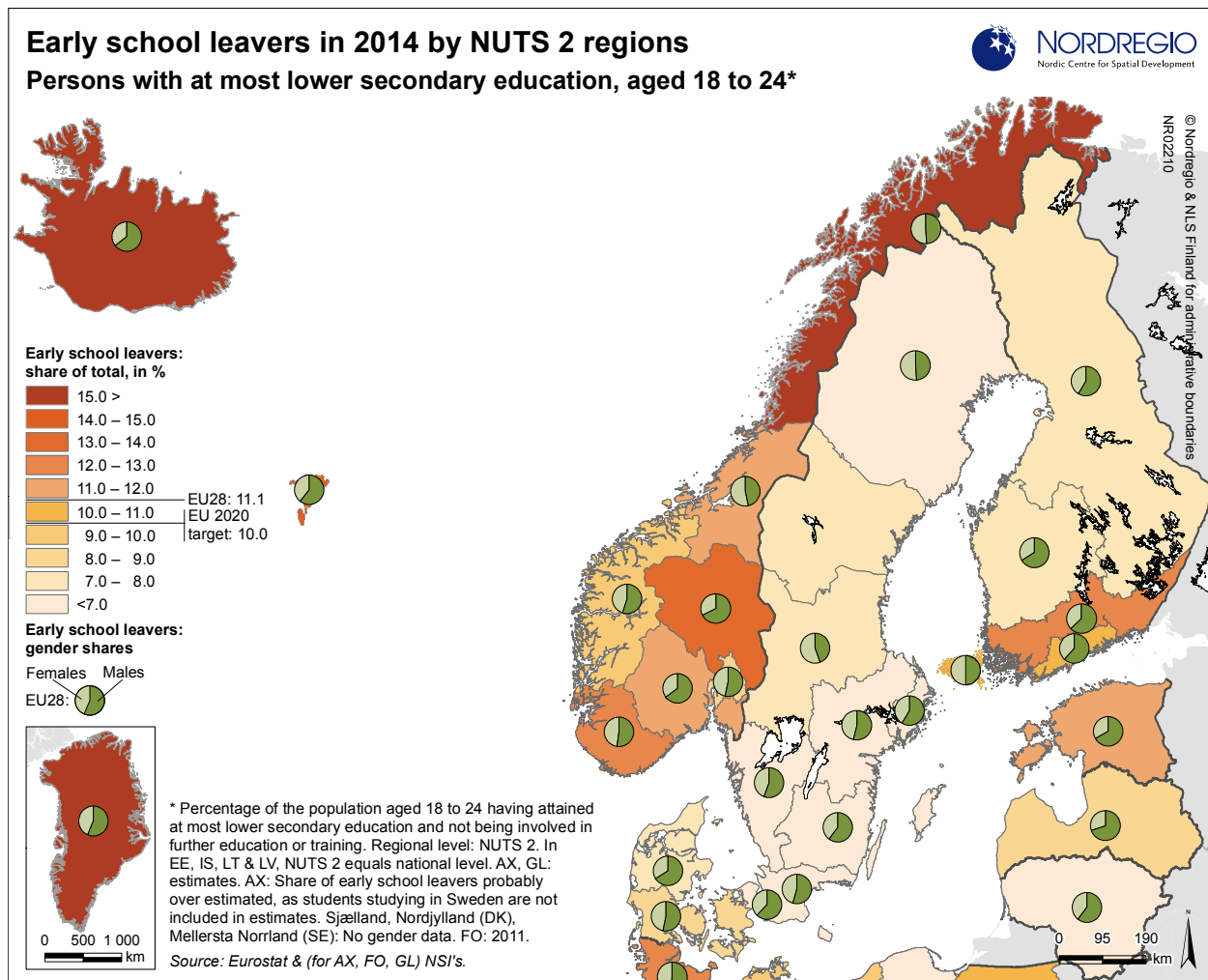


Figure 7.3: Early school leavers in 2014 by NUTS 2 regions

leaving rate, the bigger is the share of males among the early school leavers. Indeed, apart from the already mentioned exception of northern Norway, all Nordic NUTS 2 regions with early school leaver rates above 12% also had a predominance of males among the early school leavers group.

Nordic countries well placed to meet higher education targets for 30-34-year-olds

In addition to early school leaving, the other main Europe 2020 target within the education field is “at least 40% of 30-34-year-olds completing third level education”. This means that the EU promotes the view that at least two fifths of people aged 30-34 years should complete courses at the higher or tertiary education level. This target can be compared to the fact that European labour market projections have indicated that by 2020, in order for the EU to compete internationally, 35% of all jobs in the EU will require skills comparable to a completed tertiary level education (EU Commission 2015b).

This indicator, as distributed to the municipalities and regions within the Nordic Region, is visualised in figure 7.4. Blue hues display municipalities and regions which in 2014 were above the Europe 2020 threshold of 40% having completed tertiary level education. In the other direction, red hues mark administrative units where the 40% target had not been accomplished by 2014.

Perhaps not surprisingly, the highest education levels, above 40% (indicated by the three darkest blue hues), among 30-34-year-olds can, to a large extent, be found in either university cities, or in socio-economically strong municipalities in the main metropolitan areas. At the regional level in some cases the existence of an important university within a rather sparsely populated region positively contributes to a high tertiary education average in those regions. This is the case in Västerbottens län (Umeå) in Sweden and Troms (Tromsø) and

Generally, the higher the early school leaving rate, the bigger is the share of males among the early school leavers.

The other main Europe 2020 target within the education field is “at least 40% of 30-34-year-olds completing third level education”.

Sør-Trøndelag (Trondheim) in Norway. Thus, in relation to the Europe 2020 target of 40% of 30-34 years-olds having completed tertiary level education, the existence of a university within the same or nearby municipality, or within the region, to a large degree seems to influence whether a municipality or a region achieves this Europe 2020 target. In addition, it should also be noted that while 30-34 years is an age group where many people have finalised their studies, it is still, in geographical terms, a relatively mobile group. As such, the individuals who constitute it may still choose to move from the city in which their studies were undertaken.

At the national level, in the Nordic Region, this Europe 2020 headline target of 40% had, by 2014, been met in all five Nordic countries though challenges nevertheless remain. In Denmark, many students have lengthy study periods before education is completed. For Sweden there are indices of high drop-out rates. Finland, unlike most other EU countries, has not seen a steadily increasing rate of 30-34-years-old finalising their higher education (EU Commission 2015b). Instead, Finland has stayed around 45-46% over the period 2010-2014. The Faroe Islands (37%), and especially Åland (26%) and Greenland (18%), have significantly lower rates than the five Nordic countries.

In the EU as a whole, more women than men in the age range 30-34 have attained a tertiary level education with this trend increasing. The same situation exists in the Nordic Region. The Nordic average is a striking 15.1% unit difference between men and women in favour of women. In fact, no region within the Nordic countries has a higher share of highly educated males than females in the age range 30-34 (figure 7.5, bottom right corner map). This is now also the case in the Faroe Islands. In the broader age group of 25-64 years however,

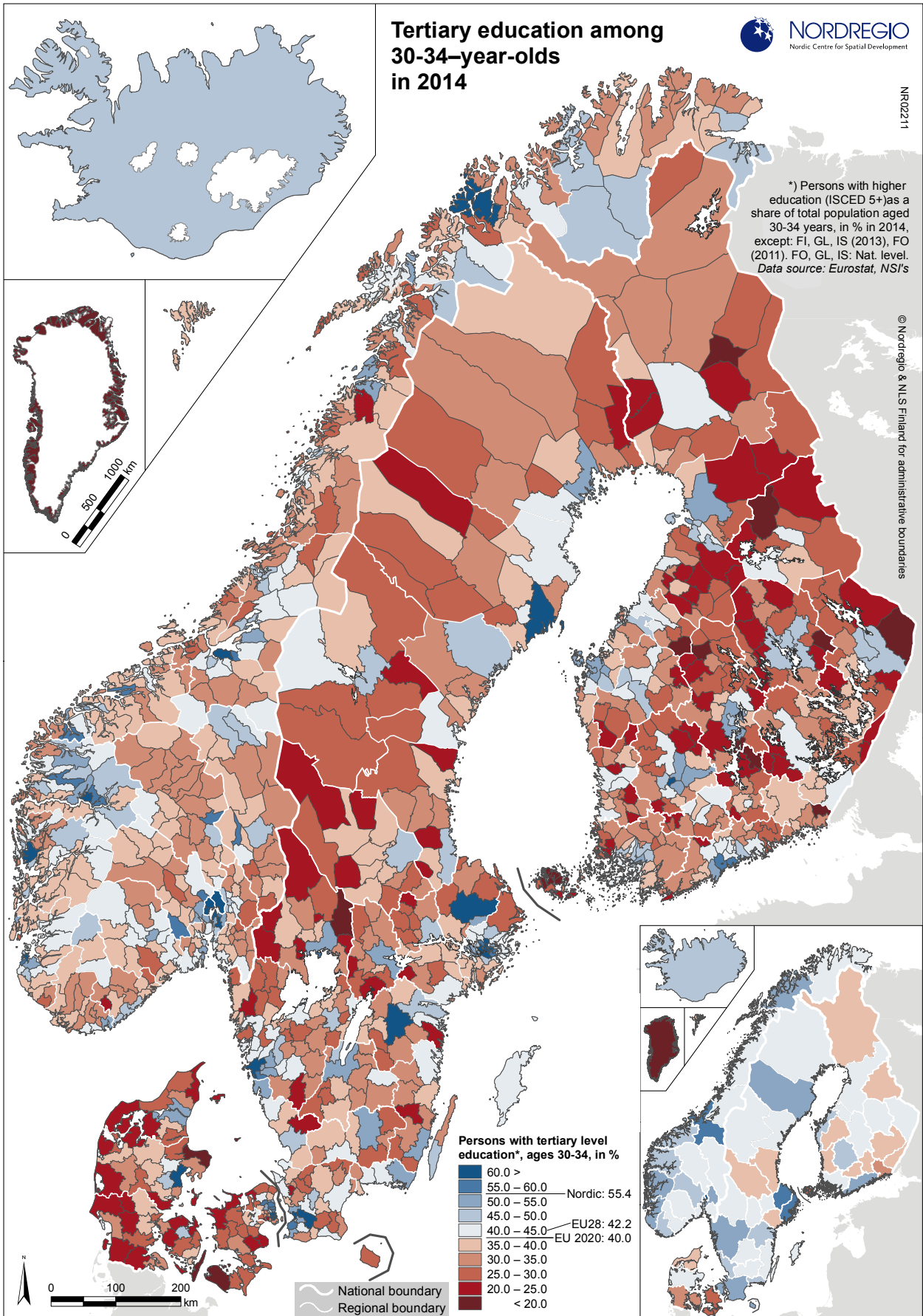


Figure 7.4: Tertiary education among 30-34-year-olds in 2014

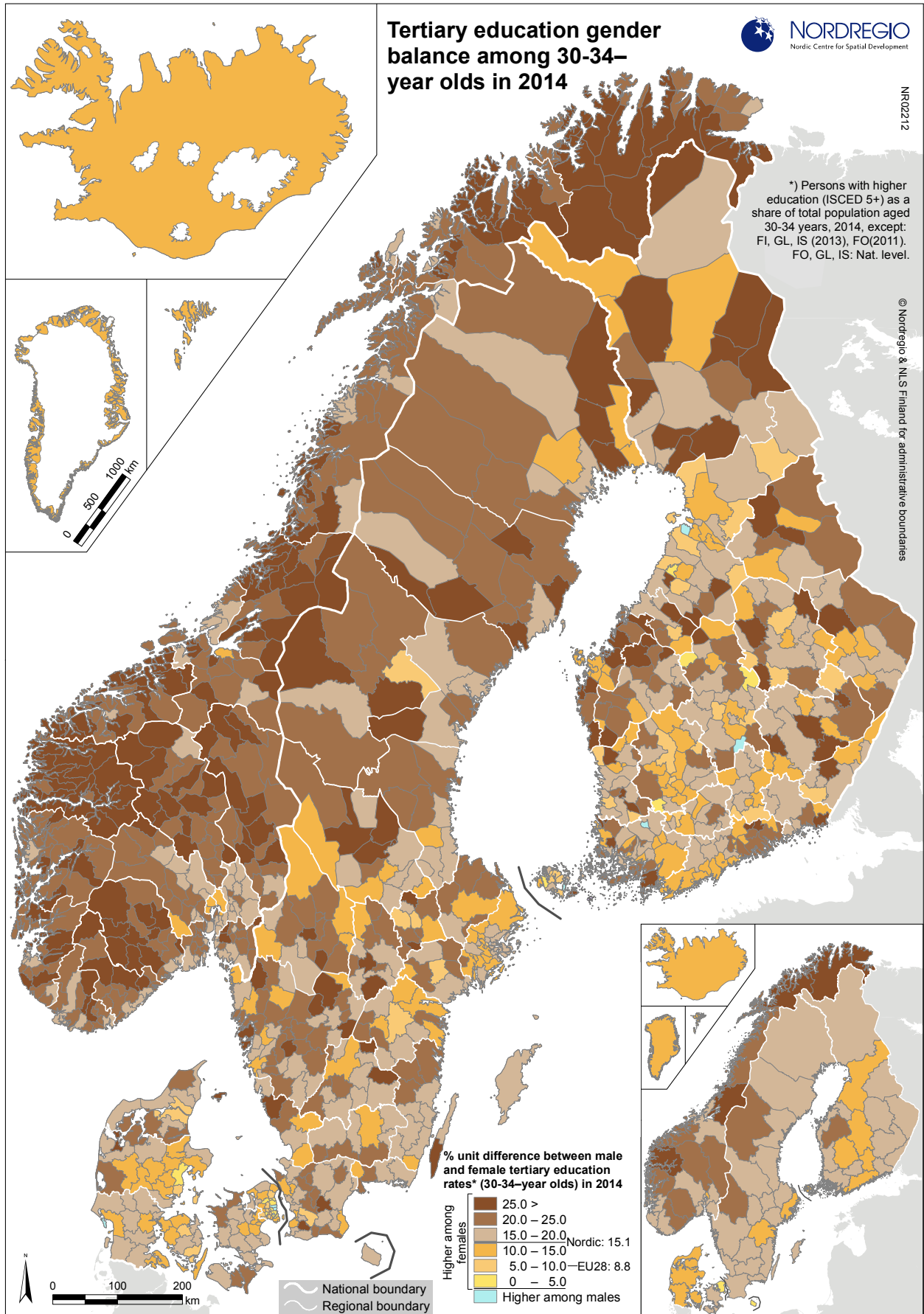


Figure 7.5: Tertiary education gender balance among 30-34-year olds in 2014

the Faroe Islands is the single remaining region within the Nordic countries that has a higher share of highly educated men than women. For the Faroe Islands, this situation can be explained primarily by the fact that women to a much greater degree than men leave home to study abroad, especially in Denmark. Taking advantage of their acquired skills, they then tend to remain abroad, perusing their career (Rasmussen, 2011, Hirshberg & Petrov, 2014). By comparison, in Greenland, the traditional pattern which saw men dominating the educational system has shifted in recent times (during the 1990s and 2000s) to reflect that in the rest of the Nordic countries (Hirshberg & Petrov, 2014).

At the municipal level, in the Nordic Region, a handful of municipalities still have a higher share of men than women with tertiary level education in age range 30-34 (figure 7.5, municipalities coloured blue), i.e. Gentofte, Lyngby-Taarbæk, Frederiksberg, and Fanø in Denmark, Luhanka, Oripää, and Lumijoki in Finland, and Åland's Lumparland. The Nordic municipalities which have the largest differences between highly educated females

In the EU as a whole, more women than men in the age range 30-34 have attained a tertiary level education with this trend increasing.

and males (dark brown hues in the map) are generally found in rural areas. In many metropolitan areas, although the share of highly educated women is still higher than men, the differences between men and women's education levels are less pronounced, suggesting that it is the men in rural areas who generally do not proceed to higher education, while men in urban areas, as well as females in both rural and urban areas, tend to opt for higher education.

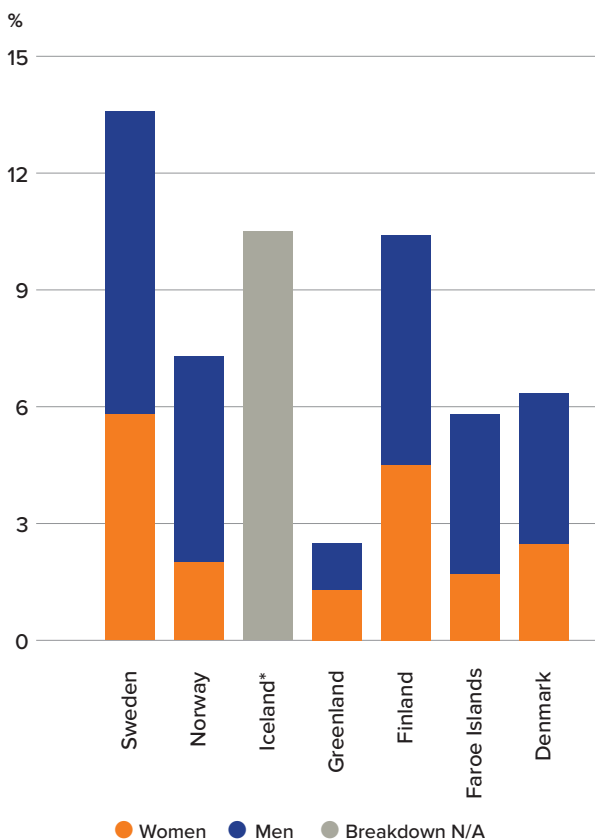
Another part of the gender dimension is that in Nordic municipalities with a higher education institution within their borders and a very high share of male students, the higher education institution is either a technical university, or a (university) college with a focus on maritime or forestry studies (Hedin, 2009).

Nordics trail on Doctorate degrees

As we can see in figure 7.6, the Nordic countries lead the way in Europe when it comes to general higher education rates, including all kinds of tertiary education, i.e. short-cycle tertiary education (typically shorter, practical and occupationally-specific programmes), bachelor, master and doctoral, or equivalent, education. As chapter 9 will however show, in comparison to other European countries, the share of doctorate holders is not particularly high in the Nordic Region. Furthermore, compared to the rest of European OECD countries, the gender gap in attaining a doctoral degree is quite apparent (although less pronounced than in e.g. Switzerland, where there are 9.5 females and 18 males with a doctoral degree per 1000 working age persons).

As shown in figure 7.6, the gender gap is relatively small in Sweden, where 5.8% of the working age female population have doctorate degree and 7.8% of the male working age population. In Finland, the gender gap is similar, but the total share of doctorate degree holders

Figure 7.6: Doctorate holders as a share of the working age population (25-64 years) in 2012



Data source: OECD Science, Technology and Industry Scoreboard 2015, NSI's. Note: Iceland: No distinction between women and men. Faroe Islands: 2011. Finland includes Åland

in Finland, around 10% of the working age population, is smaller than that of Sweden (approximately 14%). Iceland has a similar total share to that of Finland, but no gender data is available. Norway has a substantial gender gap (2.0% females against 5.3% males), and together with Denmark has a distinctly lower total share of doctorate holders than Sweden, Iceland or Finland. The Faroe Islands are not far behind Denmark's total share of doctoral degree holders, but the gender difference is pronounced with 1.7% females against 4.1% males with a doctoral degree, while Greenland has a rather equal gender share but a very small proportion of doctorate holders among the working age population, less than 3%.

Education levels of working age population above EU average

The map Persons with tertiary level education in 2014 (figure 7.7) reflects the fact that a considerable share of the municipalities in the Nordic Region – close to half of them – are above the EU average in terms of persons in working age who are also generally past their student years (i.e. aged 25-64 years) and carry higher education degrees. The map also highlights the influence that higher education provision in a municipality has on the share of that population with a higher education degree.

Municipalities in green hues in the map have levels of tertiary education above the EU average, which was 29.3% in 2014. The darker the green hue, the higher the level of tertiary education among the working age population. The ten municipalities with the highest levels of higher education, above 60%, are all to be found in the largest city regions. The highest rate, and in fact the only Nordic municipality to break the 70% barrier, is found in Kauniainen in the Helsinki area. The other top-ten municipalities are Bærum and Oslo in the Oslo region (Norway), Danderyd in the Stockholm region (Sweden), and, in the greater Copenhagen-Malmö region, Lomma, Lund (Sweden) and Frederiksberg, Gentofte, Lyngby-Taarbæk and Rudersdal (Denmark). Municipalities that are coloured yellow in the map have a tertiary education level around the EU average, 20-30%. The two brown hues reflect municipalities below the EU average, i.e. tertiary education levels among 25-64 year-olds below 20% and below 10%, respectively. Such low shares apply only to a handful of municipalities in Denmark, Finland, Norway and Sweden, respectively, but to all municipalities in Greenland while data for Iceland was only available at the municipal level.

In the Nordic Region today, more than 160 out of some 1200 municipalities have at least one higher education establishment within their borders. This reflects the policy of establishing higher education institutions in new regions, including those far from the most populous urban centres or traditional university towns,

There is a strong correlation between a high tertiary education level within a municipality and the existence of at least one university or college campus, or branch, within that same municipality.

a process which has been ongoing in the Nordic countries since the 1960s (Hedin, 2009). Higher education establishments in this context (figure 7.7) are any kind of campuses or side-branches of a university, a university college, a technical training institute, a nursing school, or other establishments of higher education, both theoretical and more practically-oriented. These municipalities are represented by a red circle in the map, centred on the municipality in question. The size of the circles corresponds to the number of campuses or branches within a municipality. Despite the fact that higher education establishments in the Nordic Region have been established fairly evenly – in a geographical sense - across the Nordic Regions, and have now existed for several decades in less populous regions, it should be noted that the number of students is still far greater in institutions in the Nordic metropolitan areas (Hedin, 2009). Moreover, in the sparsely populated North, the largest urban settlements are also the prime centres for educational resources, e.g. Tromsø in northern Norway, and Rovaniemi in Finland (Hirshberg & Petrov, 2014).

As shown in figure 7.7, there is a strong correlation between a high tertiary education level within a municipality and the existence of at least one university or college campus, or branch, within that same municipality. In fact, while slightly more than half of the Nordic municipalities have a tertiary education level below 30% (i.e. below the EU average – yellow and brown hues in the map); only 30 of these municipalities host any kind of higher education establishment. The remainder, more than 130 municipalities which contain at least one higher education establishment, all have tertiary education levels above 30%.

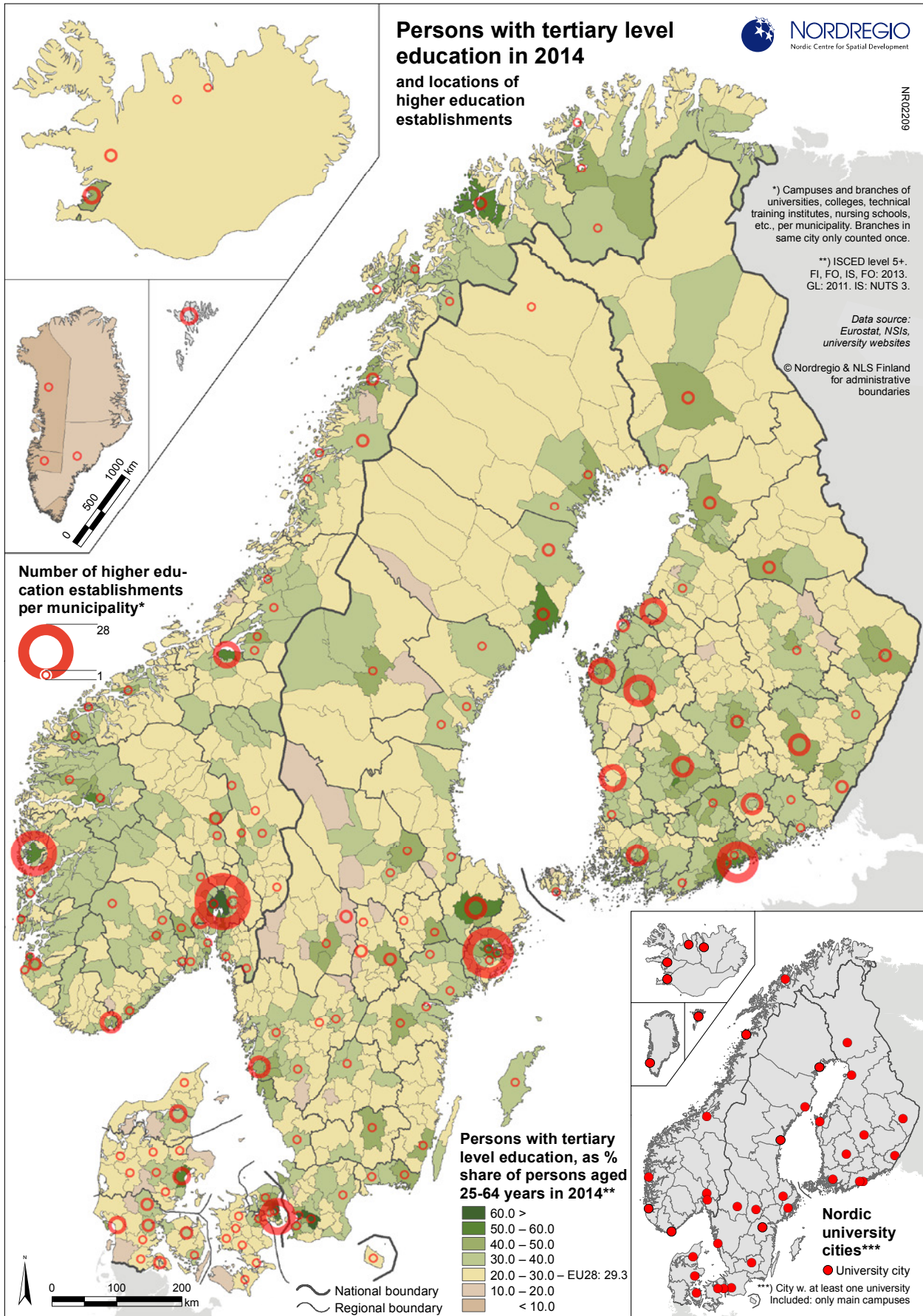


Figure 7.7: Persons with tertiary level education in 2014 and locations of higher education establishments

Broadband access enables lifelong learning through distance education

As we have seen, the location of higher educational institutions plays a role in the creation and maintenance of a local or regional resource base of highly skilled individuals. New technologies however can also now provide tools for groups living far from a college or university campus enabling them to enrol in higher education. Although so-called distance education, or distance learning, is not a new phenomenon it has grown in importance because of the new possibilities that the internet provides, while interest in distance education as a way of promoting regional development, particularly in rural and sparsely populated regions, is also becoming more prominent in the policy discourse.

Unlike campus-based education, within distance learning younger students are in a clear minority. The vast majority of distance education students are those who already have had a period of work or leave before their studies, often paired with family duties. Retirees are also a significant group here, while distance education also provides educational opportunities for students who are disabled or have health issues. Furthermore, distance education offers educational opportunities for students living in areas located far from any higher educational institutions, something which compared to many other parts of Europe, in particular suits the relatively sparsely populated Nordic Region (ICDE 2014b). Generally, the Nordic countries have opted for distance education as a method of reaching out to non-traditional learners across almost all universities, unlike some other countries in Europe, which concentrates distance learning to one or very few higher education establishments only (ICDE 2014a). National policies do however vary across the Nordic Region in respect of fees for distance learning, e.g. there is a fee for higher education distance courses in Finland, while such courses are generally freely available in Sweden.

Generally, statistics on distance education are rather scarce. For the parts of the Nordic Region where data is available, attendance rates have increased over the last decade. For example in Sweden, the number of students enrolling in distance learning higher education, or combined courses mixing distance learning with campus based courses, increased from 80 000 to 138 000 between 2004/2005 and 2010/2011 (although over the following three years, the number decreased again to 110 000 students in 2013/2014). In 2013/2014, 73 500 students in Sweden studied exclusively via distance learning. In 2013/2014 that meant that 27% of students studied at least partly via distance learning and 18% studied exclusively

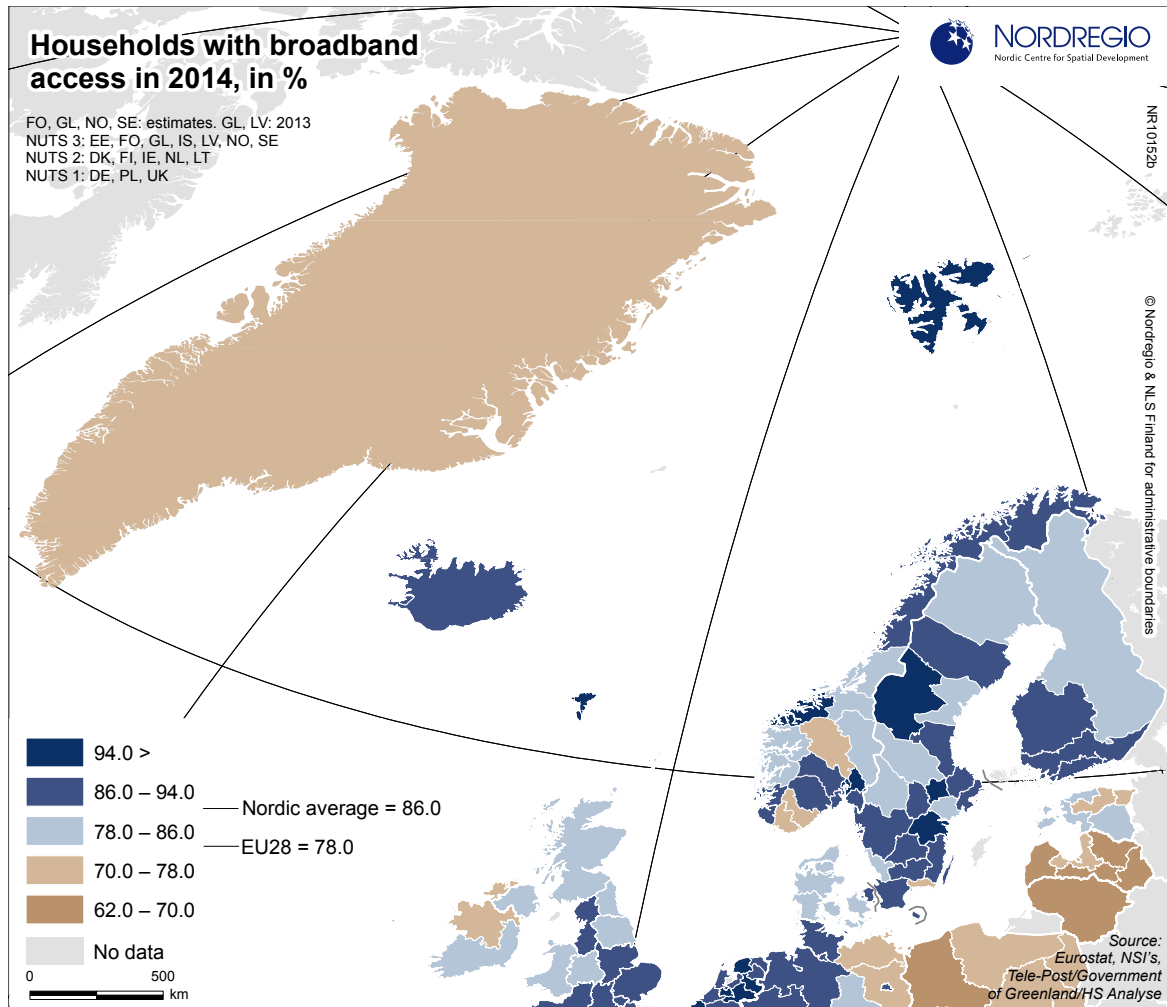
so (UKÄ 2015). Looking at data for accredited web-based schools in Norway, which include education equal both to upper secondary school and higher education levels, 16 400 people took part in web-based education in 2014, with a majority, some 62%, being women (SSB 2016a). Approximately 20% of students participating in such web-based education were enrolled in tertiary education (SSB 2016b). The majority of the students, almost 5000, were found in the age range 30-39 years. As a share of working age population (15 years or older), the highest shares of students enrolling in web-based education were found in the Finnmark, Buskerud, Hedmark, and Sogn og Fjordane fylken, regions with relatively few higher educational institutions and which also have tertiary education levels around the Nordic average, or lower (SSB 2016c).

A fundamentally important prerequisite for distance studies is the possibility to access the internet through fast and reliable connections. Figure 7.8 shows the distribution of broadband access across northern Europe at the most detailed regional level. It displays the share of households with at least one household member being aged 16–74 which has any type of broadband connection, be it fixed or mobile.

Information and communication technologies (ICT) have become increasingly important not only in people's daily lives, but also from a regional development perspective because of their ability to overcome geographical distances, particularly for sparsely populated regions. Broadband is one part of the suite of information technologies which are now of great importance for those peripheral regions where long distances impair access to services. Good broadband access can also ease the delivery of important public services such as health – and education (OECD 2011).

Information and communication technologies have become increasingly important not only in people's daily lives, but also from a regional development perspective.

Figure 7.8: Households with broadband access in 2014, in %. Note: Norway and Sweden: Limited sample sizes



The indicator presented in this map, “Households with broadband access”, stems from Eurostat’s annual regional survey on ICT use in households. It should however be noted that this indicator is defined in relation to the actual take-up of broadband connections by households, as opposed to the technological possibility of accessing broadband (Eurostat 2015b). Thus, with this indicator, the de facto usage of broadband is measured in terms of access, not to be confused with the calculated potential access to broadband (the latter method is often the way in which broadband access for national telecom agencies is measured).

It should however be noted here that Eurostat only supplies data for middle sized regions, i.e. at the NUTS 2 level, and thus that additional data was

collected from National Statistical Institutes (NSI’s) whenever possible.

In a European perspective, the broadband access rate within the Nordic Region is very high, although with some variations. A large majority of the Nordic Regions have broadband access rates above the EU28 average. While high rates are found in the capital regions, it is interesting to note that several often rather disparate regions, located outside the capital regions, actually have the highest broadband access rates. Among them are Svalbard (thanks to it being a test-bed for IT infrastructure and, since 2003, connected to the Norwegian mainland by optical fibre cables), the Faroe Islands, Jämtland, Västmanland and Östergötland in Sweden, and More og Romsdal in Norway.

Economic growth concentrated in thriving cities

Nordic economies are performing well in the European context, with the strongest growth observed in the largest urban areas. There are a number of regions that are also performing well however it is important to note that the top-performing economies in the more peripheral regions are often thriving due to a large single industry. Private sector R&D investment has seen similar concentration in large Nordic cities, in particular the capitals Stockholm, Oslo and Helsinki. Employment in knowledge-intensive sectors in Nordic Regions has been more evenly distributed with the exception of the northern parts of Finland, Sweden, and Norway, which lag far behind their southern counterparts.

Tourism emerged as a potential new driver of Nordic economies thanks to extensive growth in travel to Sweden and especially to Iceland by a wide range of international tourists in the period 2008-2014. The potential to expand this phenomenon to the whole Nordic Region remains, for the most part, unrealised but increased collaboration on tourism branding between countries would be a good first step. There is also scope for more broadly focused regional development policy to ensure resources and opportunities are distributed evenly between regional areas and their metropolitan counterparts. Eco-innovation is currently “scattered” across the Nordic countries but represents great potential to provide new opportunities both to big city regions and to sparsely populated regions.

Theme 3
ECONOMY

Chapter 8

ECONOMIC DEVELOPMENT:

Economically strong but crisis still shows

Author: **Gunnar Lindberg**

Maps and data: **Linus Rispling, Gustaf Norlén, Johanna Roto and Anna von Zweybergk**

The Nordic Regions have generally maintained their previously strong positions in relation to the EU average when it comes to economic development. Urban and capital city regions show high levels of GRP per capita, as is the pattern throughout Europe. Stockholm, Oslo, Copenhagen and the western Norwegian regions are among the wealthiest in Europe. It is also the case that capital regions and larger cities remain strong economic centres in the Nordic Region. These regions show GRP per capita levels which correspond, or even exceed, most other metropolitan regions in Europe. While southern European city regions have suffered reductions in relative GRP (Gross Regional Product) per capita, Nordic city regions continue to place at the top of the scale. The picture is not however as clear cut as it once was. Helsinki has for instance lost its position among the highest performers in the last 3-years. And in Denmark and Sweden some regions now have a significantly lower GRP per capita compared to previous years; notably Kalmar, Värmland, Hovedstaden, Syddanmark and Östfold; the same is also true for Åland. At the same time other regions are improving and have risen up the rankings e.g. Hordaland in Norway.

In addition to the urban regions referenced above, there are now also a number of peripheral regions displaying high levels of GRP per capita (figure 8.1). The Swedish and Norwegian northern regions are all performing well in relation to the European average. Indeed, some of these regions can even be viewed as 'top performers'. Greenland and the Faroe Islands are also above the European average (for Greenland though, Danish subsidies supply roughly 60% of government revenue and 40% of Greenland's GRP). However promis-

Defining GRP

The indicator Gross Domestic Product measures the overall economic output of all economic activities in a country (measured in terms of purchasing power parity, or standards). The corresponding indicator at the regional level is the Gross Regional Product (GRP). Although these measures are somewhat blunt (for instance they do not consider sustainability) in the assessment of regional performances they are still the most stable and most commonly harmonised measure for economic comparisons. Together with the labour market and other business-related indicators in this report they provide an understanding of regional economic development.

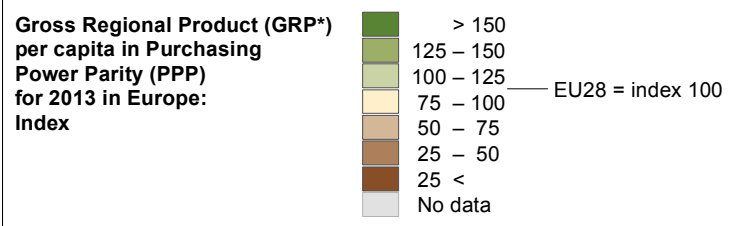
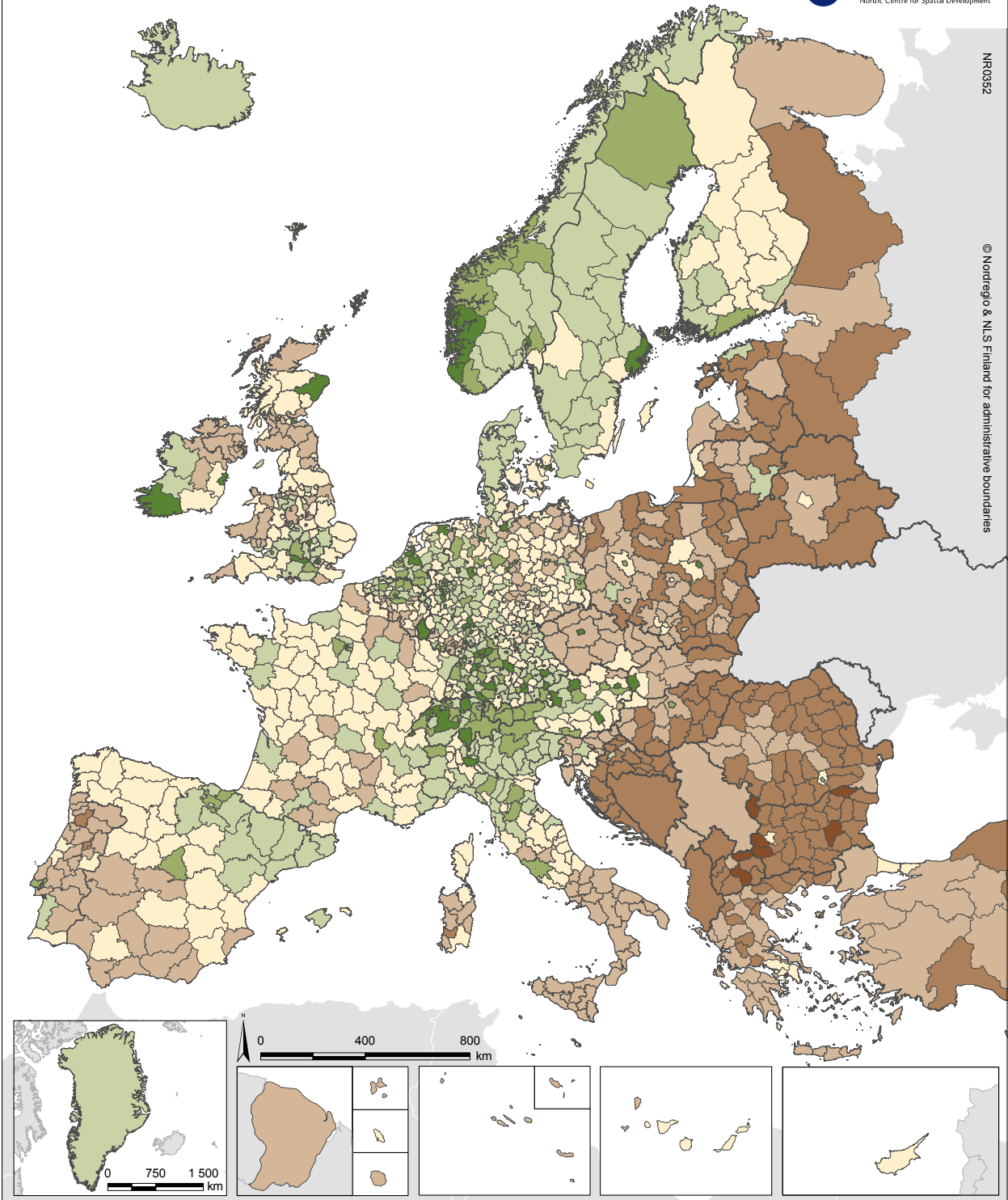
ing these facts may appear, they should nevertheless be seen in the context of the existing economic structures in those territories. Indeed, whereas urban economies are often based on a diverse range of economic activities and benefit from trends in urban growth, the economies in the top-performing but more peripheral regions are usually thriving thanks to a large, single industry often highly specialised internationally: in Åland, the transport sector; in Norrbotten, mining; and in Northern Norway, oil exploitation and fisheries. (For Norway the GRP figures from off-shore activities, including oil and gas extraction, are excluded from our maps at the

GRP (PPP) per capita in Europe in 2013



NR0352

© Nordregio & NLS Finland for administrative boundaries



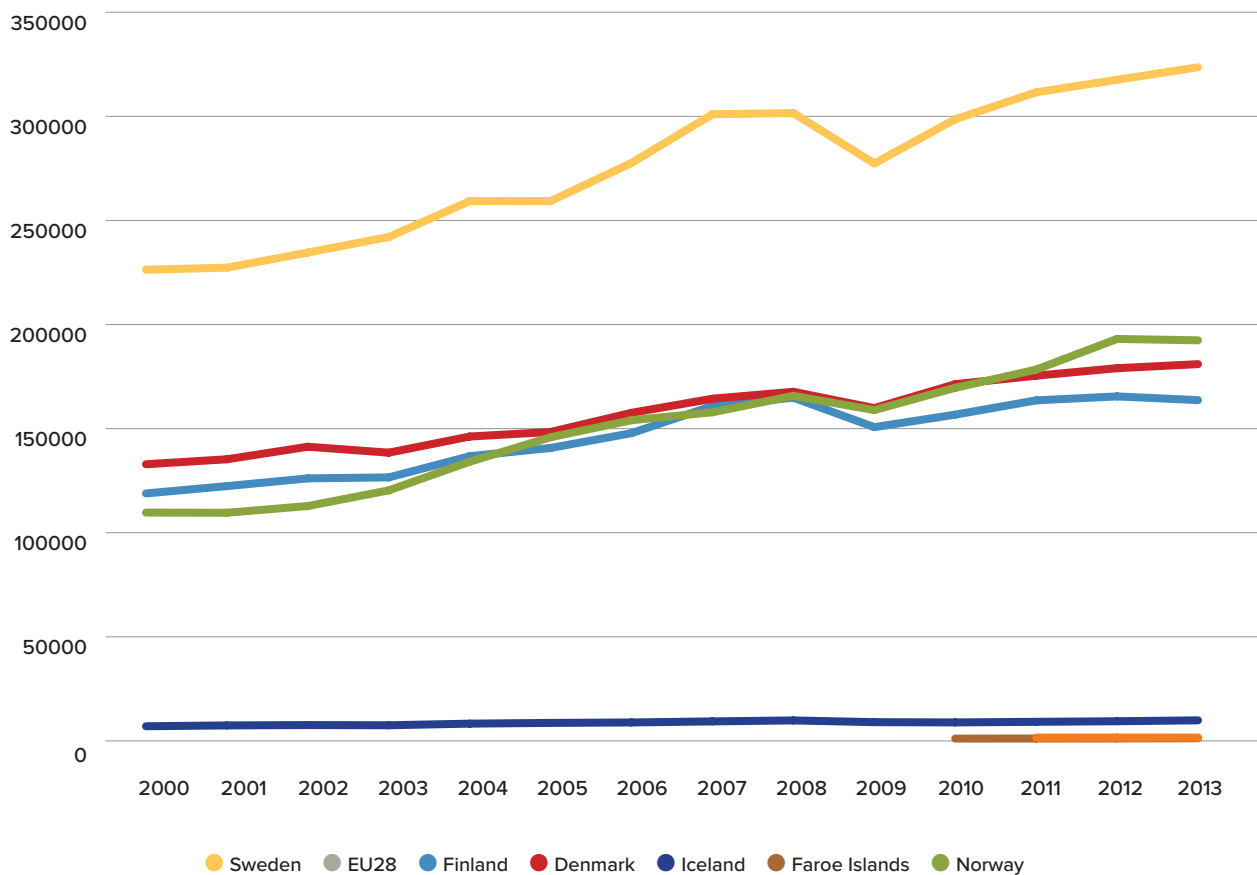
*) NUTS 3 level, except: IS, BA, RS, XK: NUTS 0 (national level). BY, N.W. RU: NUTS 2/SNUTS 2 (oblast level), TR: NUTS 2. 2013 data, except: BY, RU, TR (2011)

PPP conversion by relating data on PPP in international \$ from World Bank (BA, BY, ME, RS, N.W. RU, XK) and CIA Factbook (FO, GL) to EU28 data from Eurostat. IS: Estimate (NSI/Eurostat). NO: GRP from offshore industries excluded

Data source: Eurostat, NSI's, World Bank, CIA Factbook, Nordregio estimates

Figure 8.1: GRP (PPS) per capita in Europe in 2013

Figure 8.2: GDP (Gross Domestic Product) in the Nordic countries, 2000-2013; GDP in million Euro – Purchasing power parity (PPP)



Data source: Eurostat, NSI's, World Bank, CIA Factbook, Nordregio estimates. Note: Finland: Includes Åland; Greenland: 2011-2013; Faroe Islands: 2010-2012

regional scale. Although the vitality of these sectors induces a high level of economic performance for these regions (also related to secondary and tertiary service sectors), it leaves the regional economies highly vulnerable to changes occurring in these sectors which are usually well beyond the boundaries and the control of Nordic Regional actors, both economic and political. In this light one of the most important aspects for regional policy as it relates to these territories is to be able to use, and build upon this growth potential and current growth and wealth. Strategies need to be put in place to develop current productive sectors further, as well as to attract new businesses or sectors of activity with high added value. Although some of the regions mentioned above display strong economic growth they continue to face a number of serious challenges with respect to demographic trends and ongoing developments in the labour market, etc.

The economic crisis of 2008-2009 affected the entire Nordic Region quite severely, with Denmark, Iceland and Sweden suffering GRP decline rates of - 5%, Norway -2% and Finland as high as - 8% (figure 8.2). Most parts of

The economic crisis of 2008-2009 affected the entire Nordic Region quite severely, with Denmark, Iceland and Sweden suffering GDP decline rates of - 5%, Norway -2% and Finland as high as - 8%.

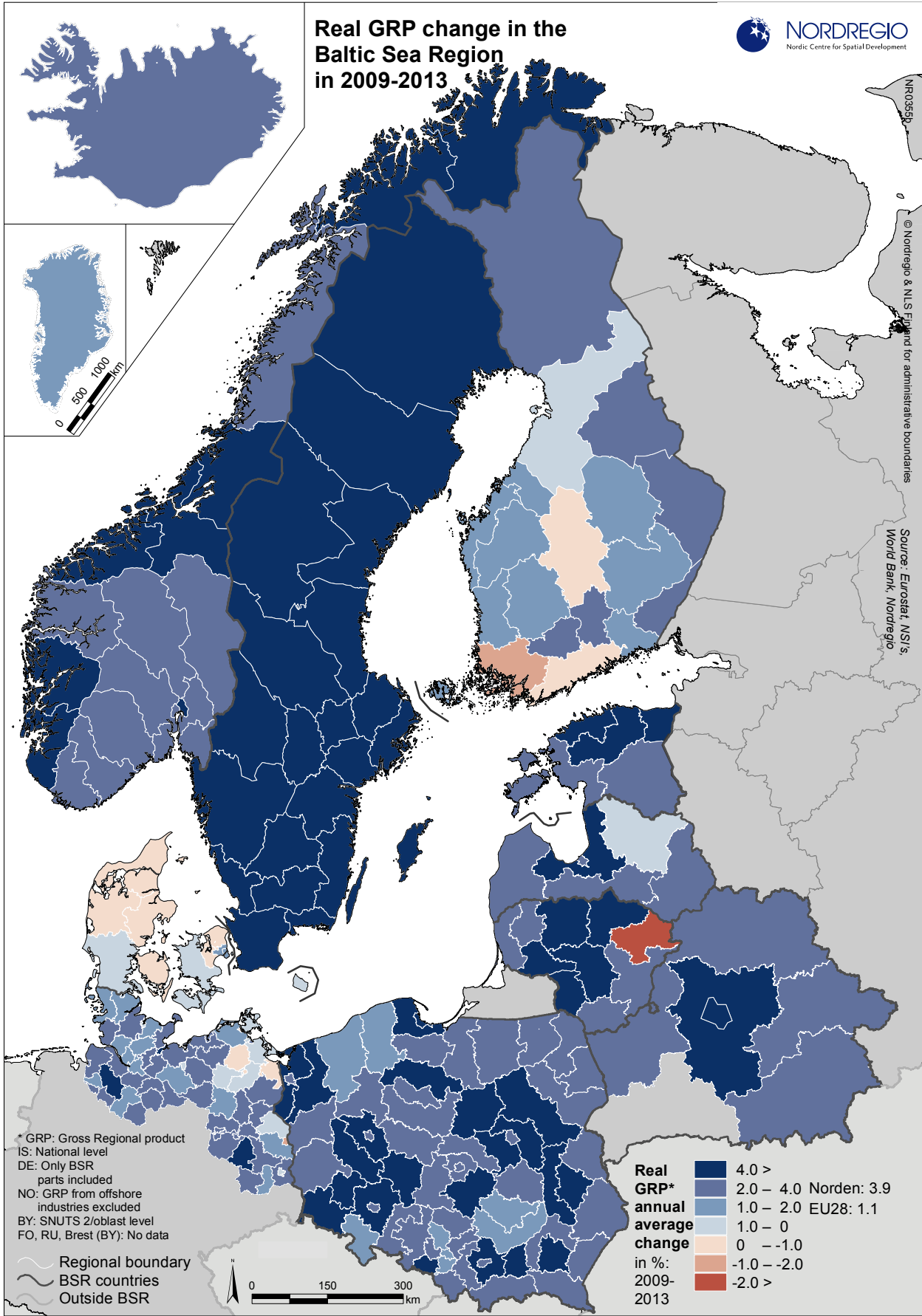


Figure 8.3: Real GRP (Gross Regional Product) change in the Baltic Sea Region in 2009-2013. Note: Faroe Islands: No data

the Nordic Region recovered in the years to come, but in 2014 and 2015 some countries (and regions) have again shown signs of slowing down: Denmark with negative numbers in 2012 and 2013 and Finland more recently in 2012 to 2014. At the finer regional level the picture is rather complex, even in countries with negative development some regions are still doing well. However, only Sweden and Iceland show strong economic growth rates throughout the regions.

Some regions in Finland persistently remain within the category just below the EU average. Most of these regions still show GRP growth rates for the period 2009 - 2013 which are around 2 - 4%, but Keski-Suomi and Pohjanmaa show weak, and in the case of the former, even negative GRP development. Comparing GRP maps with the map in figure 8.5 of dominant economic activities (by employment) it is evident that the regions in these parts of Finland have high shares of people employed in the agriculture, forestry and fisheries sectors.

Examining further the change in real GRP for the period of 2009 - 2013 national figures for Denmark and Finland can be translated into regional stories. In Denmark the regions of Nordjylland, Midtjylland, Sydjylland and Hovedstaden have all suffered from, on average, reduced annual GRP throughout this period (figure 8.3). In Finland the situation is even more serious in Varsinais-Suomi where GRP has on average decreased between 1 - 2 percent. In Helsinki-Uusimaa and Keski-Suomi the reduction is more moderate, between 0 - 1 percent. As already mentioned, Sweden has seen increases in GRP for all regions of more than 4%, but this is sensitive to what years are examined, some regions suffered rather severely from low GRP in 2008 and 2009 and therefore have made great recoveries. In Iceland the picture is equally strong, while in Norway some regions have grown above 4% while others have grown above 2%. Greenland has, on average, seen GRP increases between 1 - 2%, as has Åland.

Broadening the scope and comparing the Nordic Regions with the rest of the Baltic Sea Region (figure 8.4) it is evident that the so called "east-west divide" still persists as the Nordic Region continues to enjoy much high-

Only Sweden and Iceland show strong economic growth rates throughout the regions.

er levels of GRP per capita than their eastern (including north west Russia) counterparts. The exception is the capital cities which have relatively high GRP levels, with Warsaw being particularly strong in this regard. The Baltic States, as well as Poland, also show strong though fragmented growth in GRP and are, together with the Nordic countries, performing well compared to southern, and south-eastern, Europe. Nevertheless, the Nordic average in GRP per capita corresponds to around 125% of the European average; the southern and eastern parts of the Baltic Sea Region have values corresponding, generally, to 25-75% of the EU average. From a European and Baltic Sea perspective, regional disparities among Nordic Regions are clearly less evident compared to what may be found in many larger continental economies (such as France, Germany or Spain, see figure 8.1). As such, the Nordic Region appears to constitute a much more cohesive economic area (with no regions really lagging behind) than is the case in other parts of Europe - even in the face of the past economic crisis.

Urban regions; and urban rural disparities

Urban regions are often highlighted as the major areas for economic performance, although there are well known caveats with this representation; the most important being location of headquarters and economic reporting. With this in mind it is still clear that the major contributors to national GRP are the city regions of Stockholm, Helsinki, Oslo, Gothenburg, Malmö, and Copenhagen. Compared to the economic activities of St. Petersburg, Warsaw, Hamburg and Berlin these regions are small, but the greater region of Stockholm clearly stands out. But again, regional delimitations make a huge difference in representing urban regions (Sweden and Finland have large NUTS 3 regions).

Other places that tend to perform well economically are the regions endowed with second-tier cities: Gothenburg in Sweden, Stavanger and Trondheim in Norway and Aalborg in Denmark. This pattern is much less pronounced in Finland for which the Tampere region performs somewhat averagely in both Nordic and European terms. But in general, metropolitan and city-regions can be viewed as the key centres of economic production in the Nordic Region, not unlike many other European countries.

Urban areas or cities are often centres of economic growth and development. However, it is difficult to acquire economic growth data, such as GRP, at an urban level. And although it is widely acknowledged that GRP is an unnatural growth measure at the urban scale, there is still no simple indicator of economic growth that is tailored specifically to these urban areas. The in-

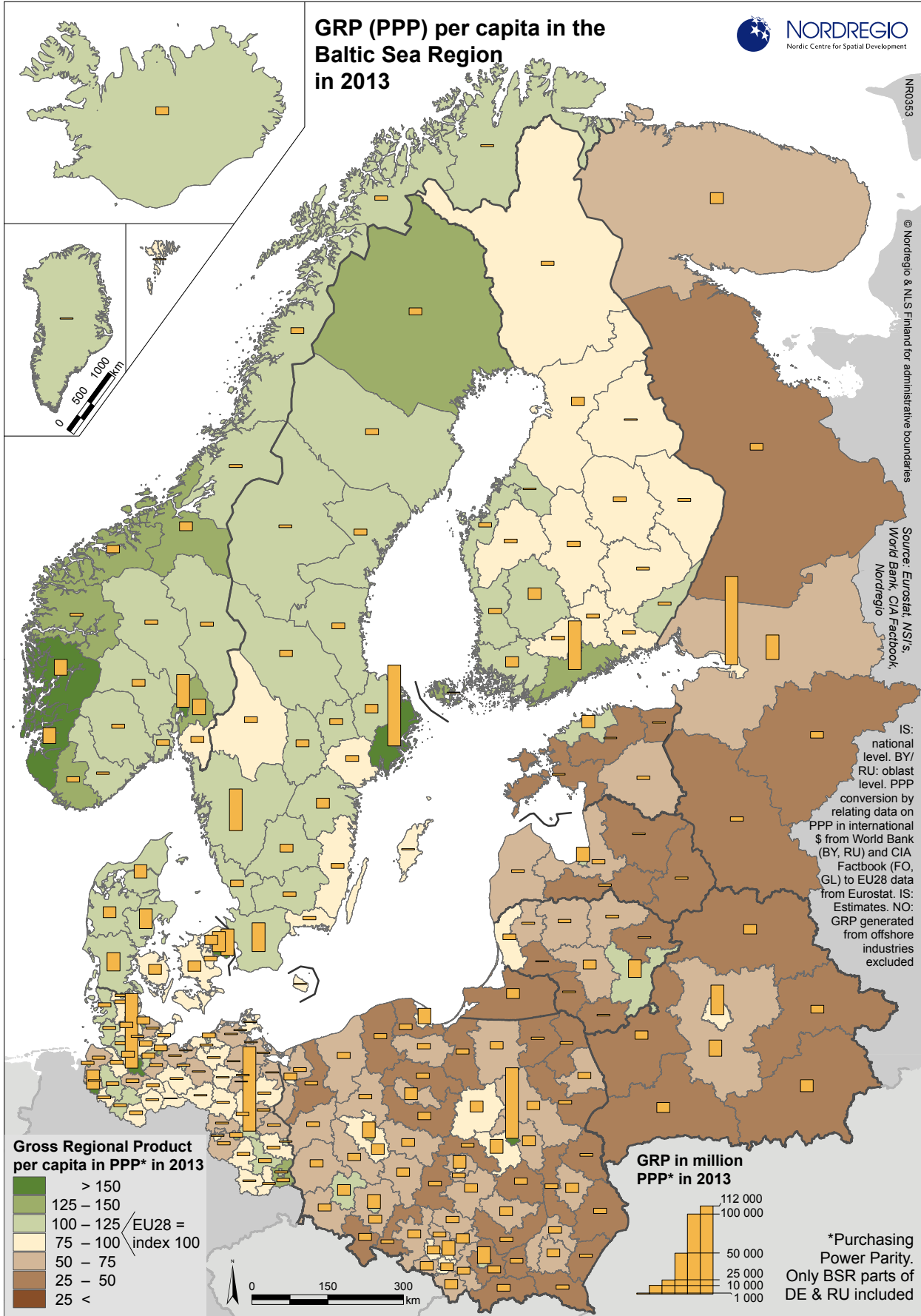


Figure 8.4: GRP (PPP) per capita in the Baltic Sea Region in 2013

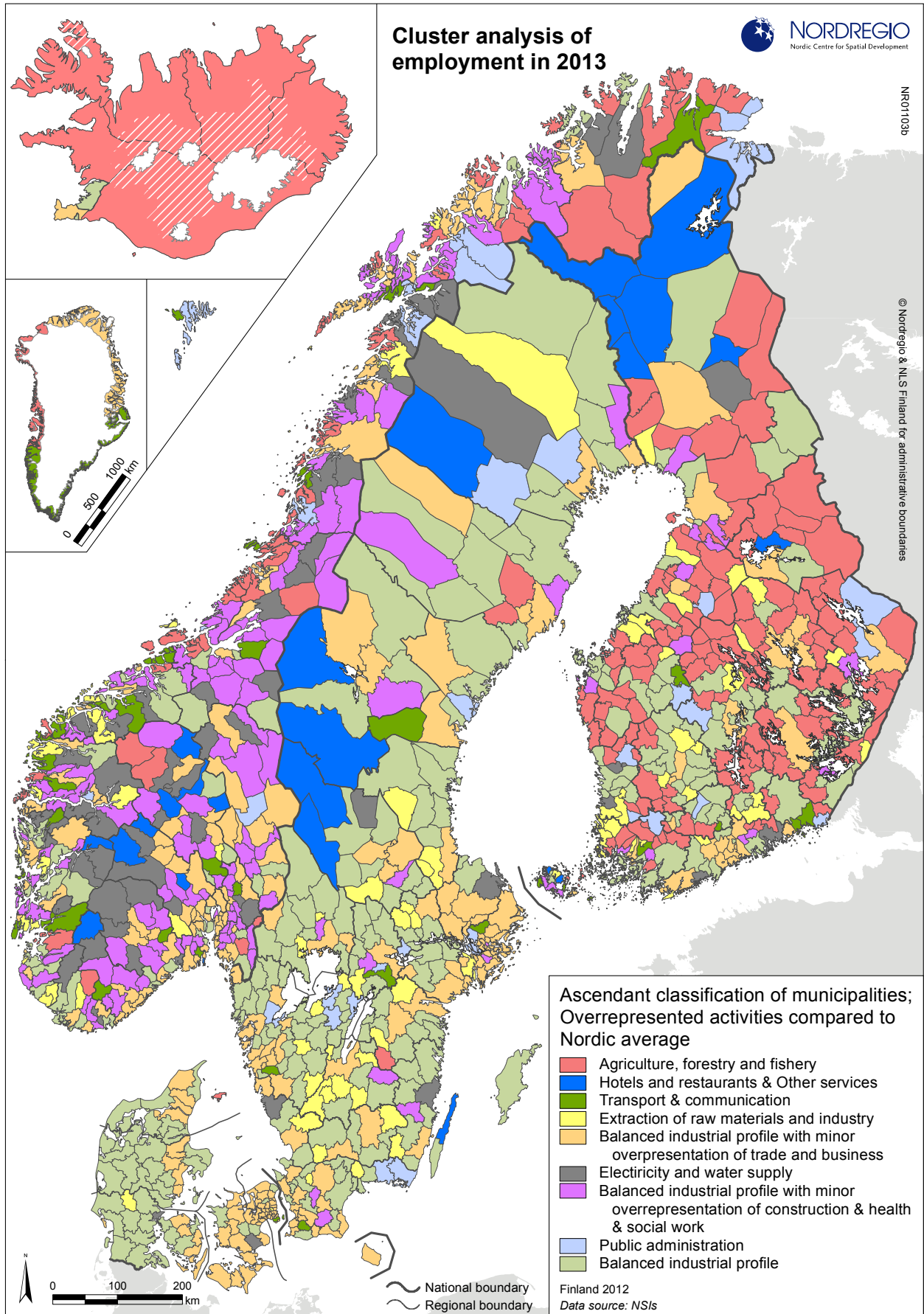


Figure 8.5: Cluster analysis of employment in 2013

terpretation of GRP per capita should be handled with care as it does not take into account the commuting flows that occur across the regional, or urban and sub-urban, boundaries.

Some of the patterns observed at the regional level hold true for cities and urban areas in the BSR. Disparities between cities in the east and west in particular, as well as core-periphery patterns (between large and small cities) can be identified. In general, urban areas stand out as relatively prosperous areas in all countries in the BSR. However, in the most eastern cities, Minsk, St. Petersburg and Polish cities (except Warsaw), the level of urban GRP is far below that in the western cities.

Some regional disparities remain

In the eastern and southern parts of the BSR the metropolitan/non-metropolitan dichotomy prevails, with rural regions showing lower levels of GRP per capita, and urban and accessible regions at the other end of the scale. In the Nordic countries however this picture is not as pronounced; many remote regions show high levels of GRP as well as strong growth, e.g. regions in northern Norway and Sweden. Hence, the prosperity of regions in the Nordic countries does not fundamentally depend on their urbanity while regional inequality is generally at a lesser level.

Indeed, in the light of the economic crisis, larger city regions in Finland and urban regions close to Copenhagen, have grown less than rural regions. Moreover, other regions in close proximity to these capital regions are also growing slower which highlights the influence of capital city regions on a larger geographical area, both in times of growth and decline.

At the same time it is clear that in the Nordic Region, economic growth is increasingly taking place in the capital regions or in the largest agglomerations. It is still unclear how this will affect the structure of regional development in the future, but it might be so that many Nordic Regions simply cannot keep up with the fast pace of development set by the larger urban regions. It is clear then that, as is the case in many other European countries, there is still scope for implementing a regional policy that ensures a more balanced approach to regional development where resources and opportunities are more evenly distributed. The Nordic countries, with their histories of cohesive regional development, have coped rather well with the latest economic crisis. Indeed, it should be highlighted here that balanced regional development seems to provide both the necessary level of resilience and a basis for fast recovery (see for instance the analysis of the ESPON ECR2 project, 2014).

The prosperity of regions in the Nordic countries does not fundamentally depend on their urbanity while regional inequality is generally at a lesser level.

Nordic regions have different economic structures

There is a rich mix of economic activities at the regional and local levels in most parts of the Nordic Region. Even though economies are becoming more open and global, there is still scope for economic interactions at the regional scale, and different economic activities interact in supply and demand relationships. These are strong to a varying degree, but together they build a fabric of regional multipliers, and sometimes support each other strategically in clusters of knowledge, materials or markets. Some regions have a more diverse economic fabric, while others have more homogeneous businesses. All regions have public sectors, and firms related to public utilities and services, to some extent. City regions are usually the centres of financial institutions, insurance firms, larger corporate headquarters, consultancy firms and firms in the tertiary sector of the economy. Secondary sectors (known as manufacturing, transport and some related service sectors) are found throughout the countries, but are strong in secondary and smaller cities, while the primary sectors of agriculture, forestry and fisheries are prevalent in more sparsely populated regions, and in the northern regions.

A map of the most dominant sector or activity will obviously hide a lot of information; however it is an interesting map to have as a backbone for analysing and discussing regional differences and Nordic Regional heterogeneity. The cluster map below (figure 8.5) only shows the dominant sector (or sectors) of employment. Other sectors are of course also important in many regions.

At first glance the map may seem to be just a mosaic of colours showing the overrepresented sectors at the

municipal level, but some clear patterns are discernible. E.g. in the rural municipalities of Finland the agricultural, forestry and fisheries sectors show a strong overrepresentation, much more than can be observed in the other countries; the exception being Iceland, which has a strong focus on fisheries in all but the Reykjavik and Keflavik municipalities. In Norway there is a tendency in many municipalities towards a very balanced industrial profile, but with an overrepresentation of construction, health and social services. In Denmark and Sweden there are many municipalities with a very balanced industrial structure, but also clusters of regions specialised in trade and businesses. In Denmark the very balanced structure seems to be overrepresented by the later (trade and businesses) in the east, and more generally balanced in the west. In some areas in Norway, Sweden and Finland there is also a strong focus on hotels, restaurants and other services – often related to tourism areas in the mountainous regions. The dominance of “electricity and water supply” in Southern Norway is also interesting to observe. In other countries (e.g. Sweden) this dominance is mainly found in municipalities dominated by nuclear power plants.

Turning to the economic interaction between the Nordic countries in terms of trade flows (figure 8.6) it is evident that proximity matters; but this is not the entire story. Russia for instance seems to be an important export country for Iceland, Greenland and the Faeroe Islands. Due to history and proximity, Finland relies more heavily on Russian trade than do for instance Sweden, Denmark or Norway. These countries trade more with Germany and Poland. Norway has strong bilateral trade with Sweden, Denmark and Germany, while Sweden and Denmark have more diverse trade patterns. South Baltic “horizontal” trade is important with strong interactions between Germany, Poland, the Baltic States and Russia. Estonia has stronger trade relations with Sweden and Finland than it does with Latvia and Lithuania. Sweden and Finland do not display as important interactions in trade with Iceland, Greenland and the Faeroe Islands as do Norway and Denmark. Iceland also trades a lot with Germany, a trade relationship which is important from the Icelandic perspective in terms of both imports and exports.

Concluding comments

This chapter has explored economic development in the Nordic Region. It found that Nordic economies are performing well when considered in both the European and the BSR context. Most parts of the region have recovered well from the severe affects of the economic crisis, although it is worth noting that in 2014 and 2015 some countries (and regions) again showed signs

Bilateral trade data

In this map (figure 8.6), which displays trade flows between countries in the Nordic Region and the Baltic Sea Region, we choose to include the largest in-flows and out-flows, respectively, per country based on the value of exports in US\$ (FOB). A high number of flows would have made the map difficult to interpret, while using only a limited number of in-flows and out-flows per country made it possible to also include flows to and from the West-Norden Region (the Faeroe Islands, Greenland and Iceland), which in absolute numbers are rather small.

The trade data in the map is derived from the Direction of Trade Statistics of the International Monetary Fund (IMF), providing a standardised and coherent dataset, similar to that published by the United Nations’ Comtrade. It should however be noted here that this data was processed and published as it was received from the reporter country. Thus, looking at the linkage between two given countries, one country might provide different import figures from those provided by the exporting country. Furthermore, there are several independent institutions working globally and producing their own estimated trade statistics.

of slowing. The Nordic countries differ somewhat from other parts of Europe in that strong economic performance is evident in regional areas as well as in the capitals and other large cities. Two caveats become important here however. Firstly, strong economies in peripheral areas are, in many cases, a result of a single, large, high performing industry. Secondly, city regions still dominate as the major contributors to national GRP. As such, scope remains for implementation of a regional policy that ensures a balanced approach to regional development and distributes resources and opportunities evenly. There is a rich mix of economic activities occurring at the regional and local levels in most parts of the Nordic Region. In some cases this results in a quite balanced industrial profile. There are other regions where the industrial profile is skewed towards particular industries, which in general makes them more economically vulnerable.

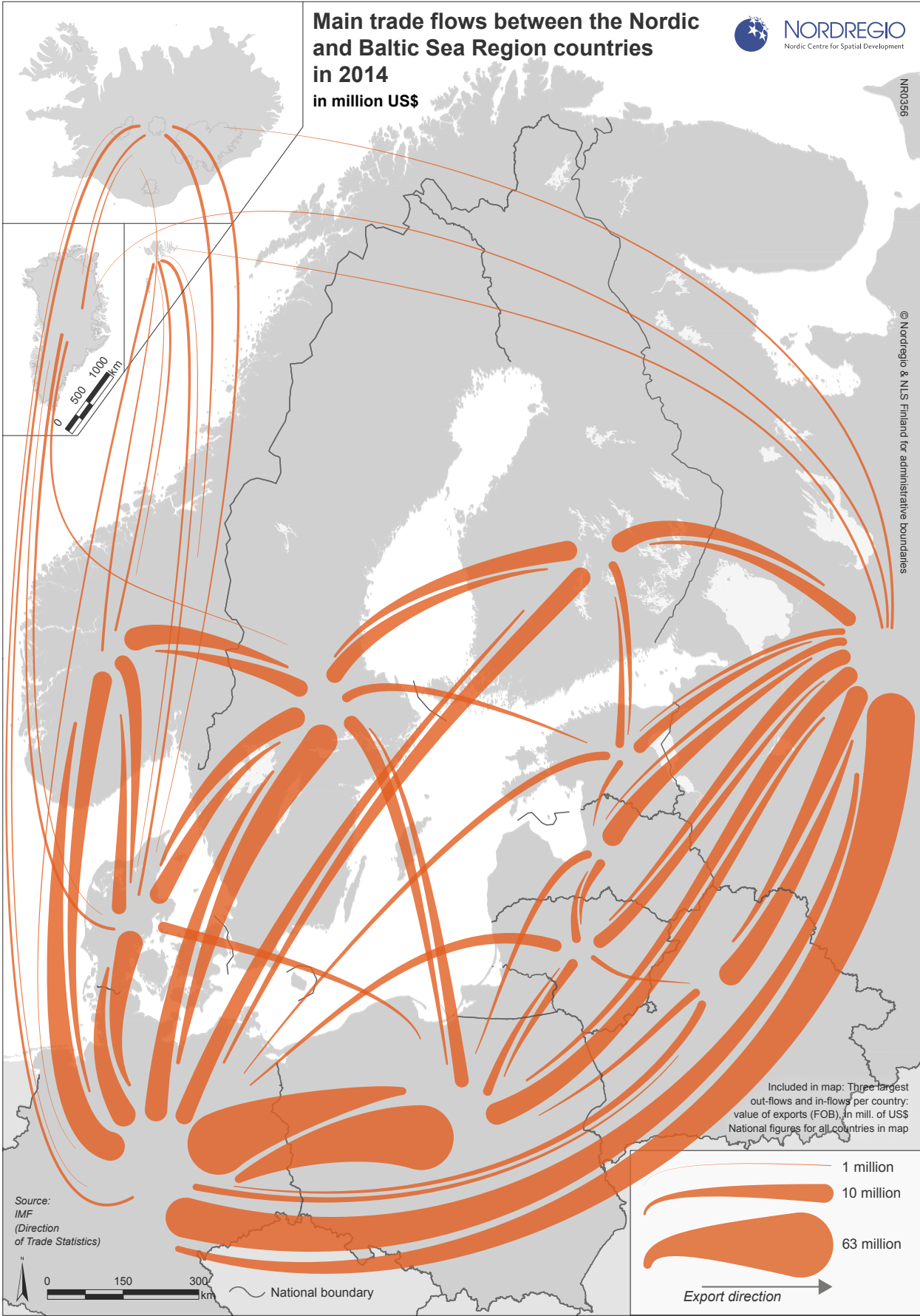


Figure 8.6: Analysis of trade in the Baltic Sea Region in 2014. Largest flows in each direction included

Chapter 9

INNOVATION:

Nordic lead the charts

Authors: **Iryna Kristensen, Jukka Teräs and Linus Rispling**
 Maps and data: **Linus Rispling and Gustaf Norlén**

Existing global challenges and continuing economic pressures place innovation at the forefront of Europe's efforts to transform the economy and stimulate global competitive advantage. The Europe 2020 Flagship Initiative, Innovation Union aims 'to improve conditions and access to finance for research and innovation, to ensure that innovative ideas can be turned into products and services that create growth and jobs' (COM 2010). In the Nordic Region, innovation is also high on the agenda. Sweden, Denmark, and Finland are the top performers according to the European Commission's Innovation Union Scoreboard 2015 and therefore offer interesting examples of how to create conditions that facilitate innovation and contribute to the EU's smart growth strategy.

This chapter explores the current status and the change in innovation performance of the Nordic Region. First, a comparative overview of the Nordic innovation performance along with a reflection on the change in performance levels over time is presented. Second, the chapter reviews some of the primary enabling factors in innovation performance e.g. the availability of a highly-skilled workforce, business R&D investment and employment in the knowledge-intensive sectors of the economy, in a European context. Third, an overview of the Nordic performance on eco-innovation is presented.

Nordic countries among the top European performers on innovation

There is a general consensus in the literature that place matters for innovation and regions play an important role in enabling innovation and in the achievement of national and regional growth objectives (OECD 2013). This section provides a comparative assessment of the regional innovation performance of the Nordic coun-

Regions are classified into four groups showing different levels of regional innovation performance: innovation leaders, innovation followers, moderate innovators and modest innovators.

tries in the European context. The regions' performance is measured by the Regional Innovation Scoreboard (RIS) index which incorporates three types of Innovation indicators i.e. enablers e.g. tertiary education and R&D expenditures as a percentage of GDP; firm activities e.g. EPO patent applications, SMEs innovation/patents and R&D expenditure in the business sector as a percentage of GDP; outputs e.g. knowledge-intensive activities (Hollanders et al., 2014). Regions are classified into four groups showing different levels of regional innovation performance: innovation leaders, innovation followers, moderate innovators and modest innovators. Figure 9.1 illustrates the current position of the Nordic Region in respect to their relative performance on the RIS index compared to that of the EU and highlights changes in performance over the period 2008-2014.

Regional innovation scoreboard (RIS) in 2014 Comparative assessment of innovation performance

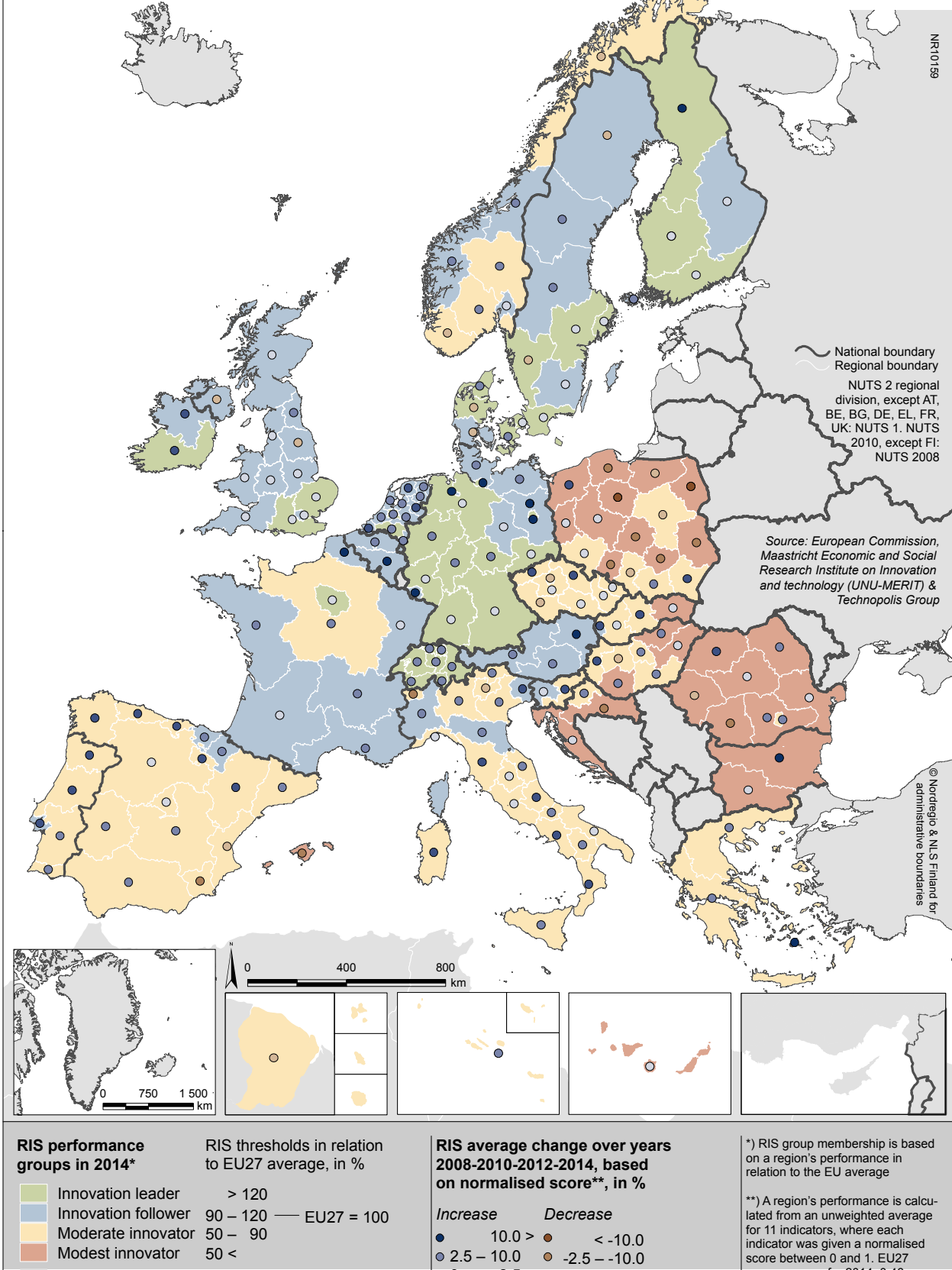


Figure 9.1: Regional innovation scoreboard (RIS) in 2014

The Nordic countries, together with Germany, Switzerland, Benelux countries, the UK and Ireland, come out on top in the RIS rankings, displaying a high level of innovation performance. Both Sweden and Denmark are represented by regions of two performance groups i.e. innovation leaders and innovation followers, whereas Finland shows a relatively homogeneous innovation performance as all regions with an exception of Itä-Suomi (East Finland) are innovation leaders. Over the period 2008 – 2014, the majority of the Nordic Regions have exhibited positive trends in innovation performance. Across all Nordic NUTS 2 regions, the most positive change in growth performance (above 10%) took place in Pohjois-Suomi (North Finland) followed by Hedmark og Oppland and Vestlandet (both in Norway), Norra Mellansverige and Mellersta Norrland (Sweden) and Nordjylland (Denmark) with an average change above 2.5%. In contrast, innovation performance in Midtjylland and Syddanmark in Denmark, Västsverige and Övre Norrland in Sweden, and Agder og Rogaland in Norway dropped by an average of between 2.5% and 10%.

Enabling factors in innovation performance

Advanced research degrees

With a shift toward knowledge-based economic activity and increasing specialisation in science and research, the demand for human resources with advanced research degrees has substantially increased (OECD 2015). In international comparison with respect to the share of individuals with doctoral degrees (out of the population aged 25-64), the Nordic countries, with one exception (Sweden), do not feature in the top 5. Switzerland has the highest share in Europe (27.5%) followed by Austria (15.8%) and Sweden (13.6%). While Switzerland accounts for the largest share of working population holding PhD

Norway has the highest share (36%) of international PhD graduates followed by Denmark (33%), Sweden (29%) and Iceland (26%).

Table 9.1: Number of people who earned a PhD in 2013, by citizenship

Country	Total	Own country	Foreign country	Unknown
Denmark	1 949	1 305	644	0
Finland	1 724	1 420	304	0
Iceland	57	42	15	0
Norway	1 524	972	552	0
Sweden	2 650	1 786	777	87

Data source: NIFU, NSI's. Note: Finland: Includes Åland, Faroe Islands and Greenland: No data

degrees in Europe, Sweden has the highest share among the Nordic countries, with the other four Nordic countries following them in the top half of the list.

Foreign PhD graduates constitute a substantial share of the total number of doctoral graduates in Europe, including the Nordic countries, helping to increase the knowledge potential of the host country as well as building up networks with research and development institutes abroad. Table 9.1 presents the number of doctoral graduates in the Nordic countries, by citizenship. Norway has the highest share (36%) of international PhD graduates followed by Denmark (33%), Sweden (29%) and Iceland (26%). The share of foreign doctorate holders in Finland falls below the 20% margin (18%). It is however worth mentioning that the share of international doctorate holders in Finland has significantly increased in the past decade (as they constituted only 8% of PhD graduates in Finland, in 2000).

Business R&D investment

Figure 9.2 illustrates the change in research and development (R&D) investments in the business sector in the Nordic Regions in the period 2007-2013. It should however be noted here that the map does not depict the current size of the business sector, only the change in R&D investments, both in absolute terms (size of the circles) and in percentages (blue hues for positive change, red for negative). There is a clear difference here in respect of R&D investments in the dominant Nordic cities and

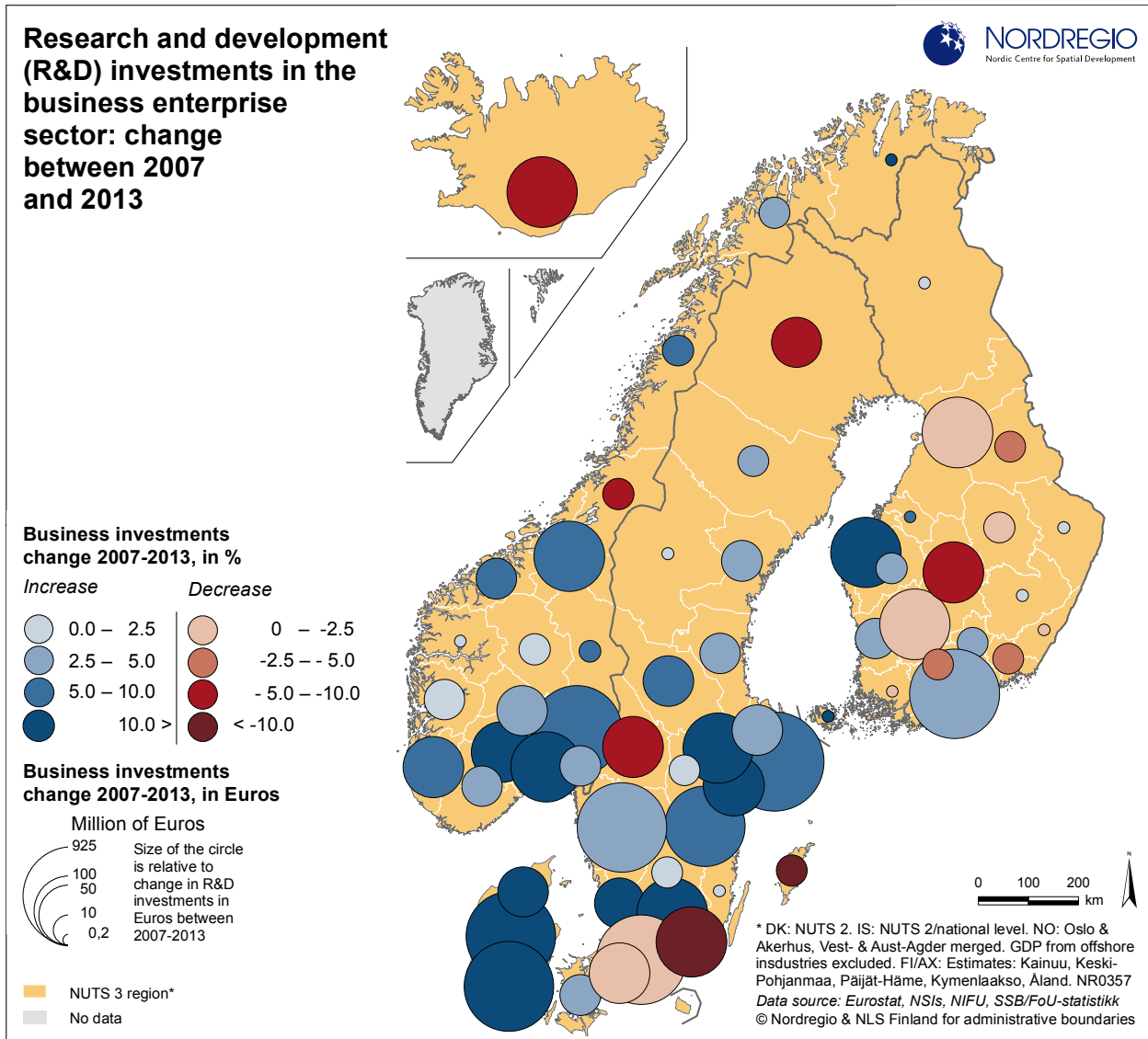


Figure 9.2: Research and development investments in the business enterprise sector: change between 2007 and 2013

regions compared to several peripheral regions; the strong Nordic RDI environments have experienced considerable growth regarding R&D business sector investments (ranging from 5 to 10%) whereas many of the Nordic peripheral regions i.e. Norrbotten, Värmland, Blekinge and Gotland in Sweden, Nord-Trøndelag in Norway, Iceland and Keski-Suomi in Finland have experienced a dramatic decrease (over 5%) in business R&D. In Norway, the more peripheral regions have not suffered significantly compared to their counterparts in Sweden and Finland, which is partially attributed to regional policy differences across the Nordic Regions. As noted previously, in Iceland (in this case measured only at the national level), business R&D investments have decreased significantly (over 5%) during the period 2007-2013. A significant increase in private R&D invest-

ments, both in terms of percentage change and in terms of millions of Euros, has however been observed in Vestfold and Telemark in Norway, in the Jutland regions of Denmark (Nordjylland, Midtjylland and Syddanmark), in Halland and Kronoberg regions in Southern Sweden as well as in Västmanland and Södermanland in Eastern Central Sweden and in Pohjanmaa, in Finland.

The existence of market failures e.g. knowledge spillovers and the lack of certainty over R&D benefits etc., are often suggested as reasons for introducing tax reductions. They are expected to prompt an upswing in private R&D investment and, in turn, to promote the growth of innovation outcomes and long-run expansion. In the Nordic countries however the major portion of R&D expenditure stems from the business sector despite the existence of rather modest (or even disincentives as in the

Figure 9.3: Direct government funding of business R&D and tax incentives for R&D in 2013

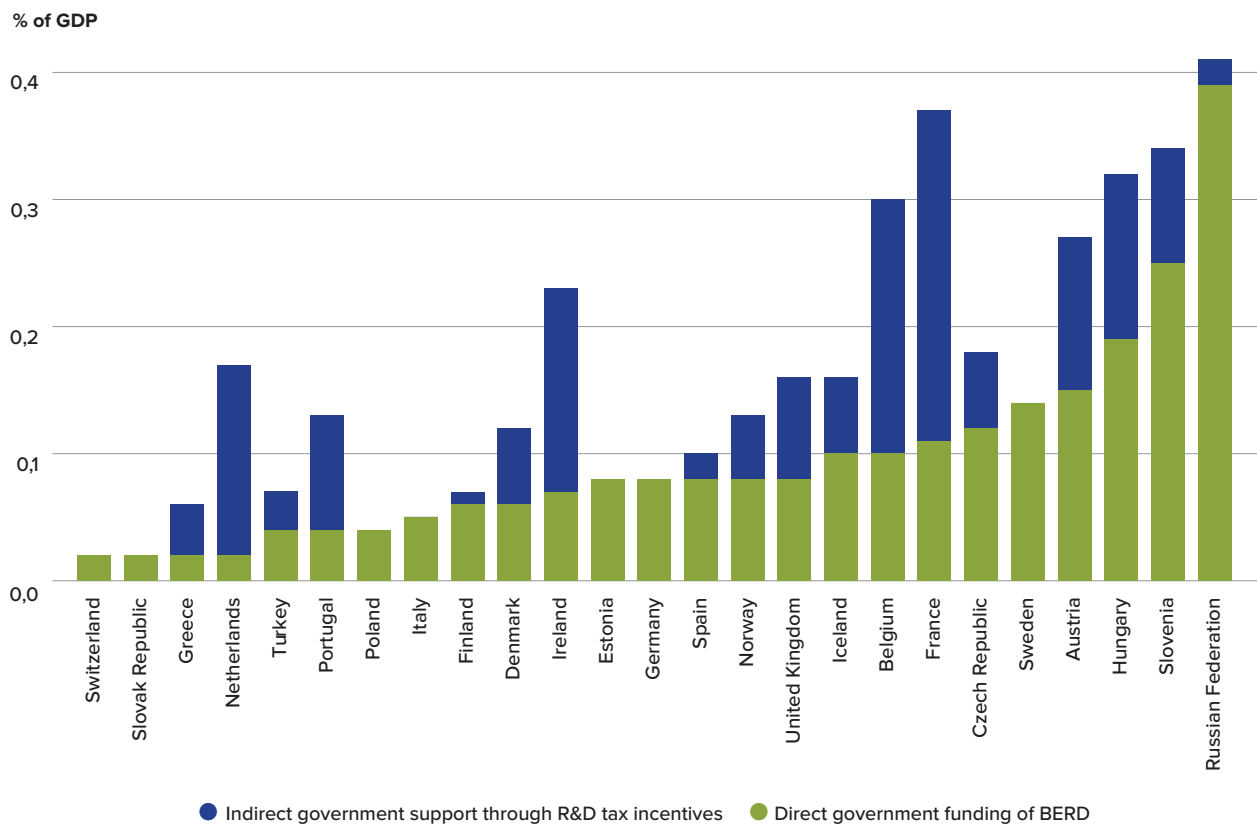


Figure 9.3: Direct government funding of business R&D and tax incentives for R&D in 2013: Indirect government support through research and development tax incentives, and direct government funding of BERD (Business enterprise expenditure on research and development). Selected countries.

case of Sweden) R&D tax incentive schemes. In 2013, Finland introduced a tax allowance as a temporary measure, although its volume was rather small. This supports the idea that tax incentives should be seen more as supplementary tools than as substitutes for the basic 'enabling conditions' such (OECD 2002). The chart contained in figure 9.3 illustrates the existence of a wide variation in R&D tax incentives across Europe. The overall level of government R&D support, which is crucial from the viewpoint of private sector, is a combination of direct government funding of business R&D and indirect government support through R&D tax incentives. In the overall comparison of direct and indirect R&D support, the Nordic countries are positioned in the mid-section of the graph (see figure 9.3). It is clear from the graph, however, that the size of government R&D support does not reflect the country's innovation performance per se; the key to the innovativeness of regional and national economies lies in the existence of favourable framework conditions and well-functioning innovation systems.

The key to the innovativeness of regional and national economies lies in the existence of favourable framework conditions and well-functioning innovation systems.

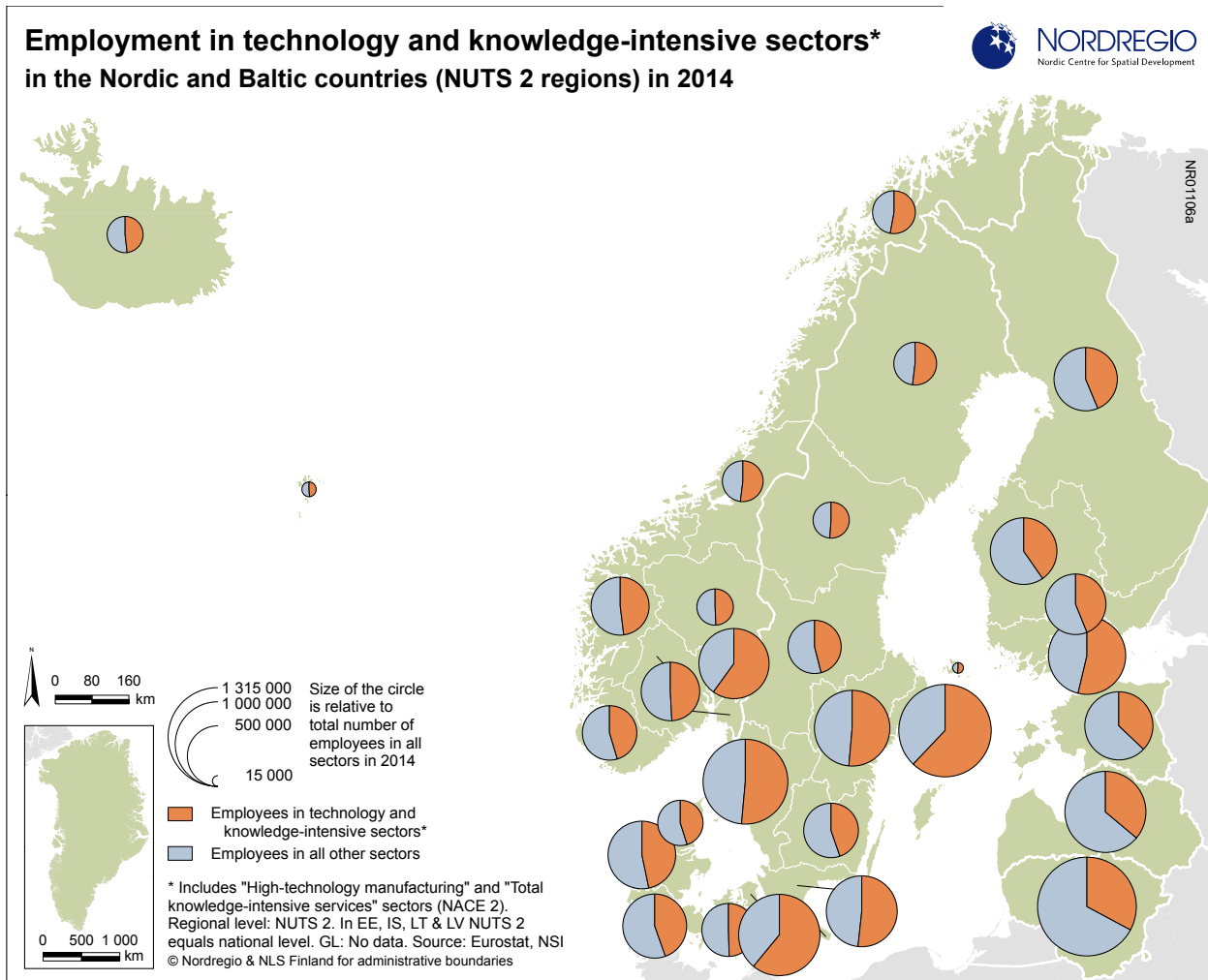


Figure 9.4: Employment in technology and knowledge-intensive sectors in the Nordic and Baltic countries (NUTS 2 regions) in 2014

Employment in knowledge-intensive sectors²

As noted previously, Europe has enhanced its academic tertiary education output in recent years. Moreover, many countries have set up national measures with the aim of attracting a highly qualified workforce and human resources into science and research, including a specific focus on encouraging more women into these fields. Figure 9.4 presents figures for employment in the technology and knowledge-intensive sectors in the Nordic and Baltic countries in 2014. The figure illustrates not only the absolute concentration of Nordic technology and knowledge-intensive jobs to the major cities and regions but also the high share of technology and knowledge-intensive jobs in the leading cities and regions, such as the capital areas. There are, however, some examples of the existence of relatively high concentrations of knowledge-intensive jobs in some Nordic Regions outside the major cities, as figure 9.4 illustrates, among them, in Norway, Trøndelag and Nord-Norge (Northern Norway), and in Sweden, Östra

Mellansverige (East Middle Sweden), Mellersta Norrland (Middle Norrland) and Övre Norrland (Upper Norrland). In peripheral regions, economic diversification into knowledge-intensive activities is often prompted by rather limited venture capital inflow as in the case of Övre Norrland (Upper Norrland). Although medium-low and low-technology industries remain important for employment and value-added generation in Övre Norrland, the transformation of the regional profile towards more knowledge-based industries like life sciences and information and communication technologies significantly increases its potential to attract foreign investors to the region. Within the Nordic Region, the smallest shares of knowledge-intensive jobs are to be found in the three northernmost Finnish NUTS 2 regions, which is partially attributed to their traditional economic structures characterised by a predominance of basic and traditional industries. Moreover, figure 9.4 illustrates the relatively high share of knowledge-intensive jobs in the Nordic Regions compared to the Baltic

² Eurostat defines an activity as knowledge intensive if the tertiary educated persons employed represent more than 33% of the total employment in that activity (http://ec.europa.eu/eurostat/cache/metadata/Annexes/htec_esms_an8.pdf)

countries (which, in this case of NUTS 2 regions, equate to the national level for Estonia, Latvia and Lithuania). The growing potential of knowledge and intellectual capabilities reflected in an increased share of employees in knowledge-intensive sectors, indicates the strong commitment of the Nordic economies to research and innovation for growth and productivity.

Eco-innovation

Given the EU's ambition to establish bio-economy as a cornerstone of the European economy green research is recognised as one of the investment priorities under the Horizon 2020 framework programme for research and innovation. Growing demand for green solutions has provided a niche for competition where the EU has been among the first movers; however, building a green economy requires multidisciplinary innovative solutions, the development of new business models, new opportunities and new skills. The Nordic countries are among the world's innovation leaders, having achieved a significant competitive advantage in the field of green solutions. The Nordic praxis, therefore, can serve as an example of how to create green growth in practice, thus contributing to the EU's market positioning and competitive advantage in the field of green solutions.

Figure 9.5 on Green patents in the Nordic Region illustrates how well the regions of the Nordic countries perform in this dimension of eco-innovation. The situation in 2011 is displayed by pie charts, in which the magenta (purple red) colour represents the share of the total number of patents (magenta colour in addition to grey colour of the pie charts, and the size of circles), while the annual average change over the years 2006-2011 is presented in background colours, i.e. green hues represent a significant positive change, yellow a rather neutral trend (between 5% and -5% annual average change), while orange hues show a significant negative trend. Green patents in

The Nordic countries are among the world's innovation leaders, having achieved a significant competitive advantage in the field of green solutions.

Regions with the largest populations and a large number of total patents generally do not have large shares of green patents.

this map cover patents classified as general environment, energy generation (renewable and non-fossil sources), technologies for mitigation potential, transportation emissions abatement/ fuel efficiency, and buildings/ lighting energy efficiency. There are several methodological issues related to measuring patents since e.g. not all inventions are patented or inventors may protect the inventions using other methods.

A high relative shares of green patents as a percentage of all patent applications, (above 25%) and also a relatively high number of total patents, are found in the Pohjanmaa region on the West Coast of Finland, in several regions in Denmark, e.g. in Østjylland, Vestjylland and Sydjylland, in Norway's Buskerud fylke and in Swedish Kronobergs län and Västerbottens län (see Figure 9.5). The number of green patents here can, in part, be assigned to the concentration of bio-related activities in some of these regions e.g. biorefinery (Västerbotten), green energy (Vestjylland). Moreover, in regions with a very small total number of patents, there are also several cases where the green patent share is above 25%: Kymenlaakso and Pohjois-Karjala in Finland, Finnmark and Hedmark in Norway.

A striking additional feature here is that those regions with the largest populations and a large number of total patents generally do not have large shares of green patents (although the actual number of green patents is likely, by far, to outnumber those of regions with smaller populations). Moreover, Nordic Regions are generally too small to independently secure their global position in the green technology sector. As such, closer cooperation on research and green technology development, as well as the establishment of common frameworks across the Nordic Region, will better enable all five countries to maximise the value of their competitive advantage enabling them to become a major force in the field of green growth.

The Eco-Innovation Scoreboard (Eco-IS) complements other measurement approaches in terms of the innova-

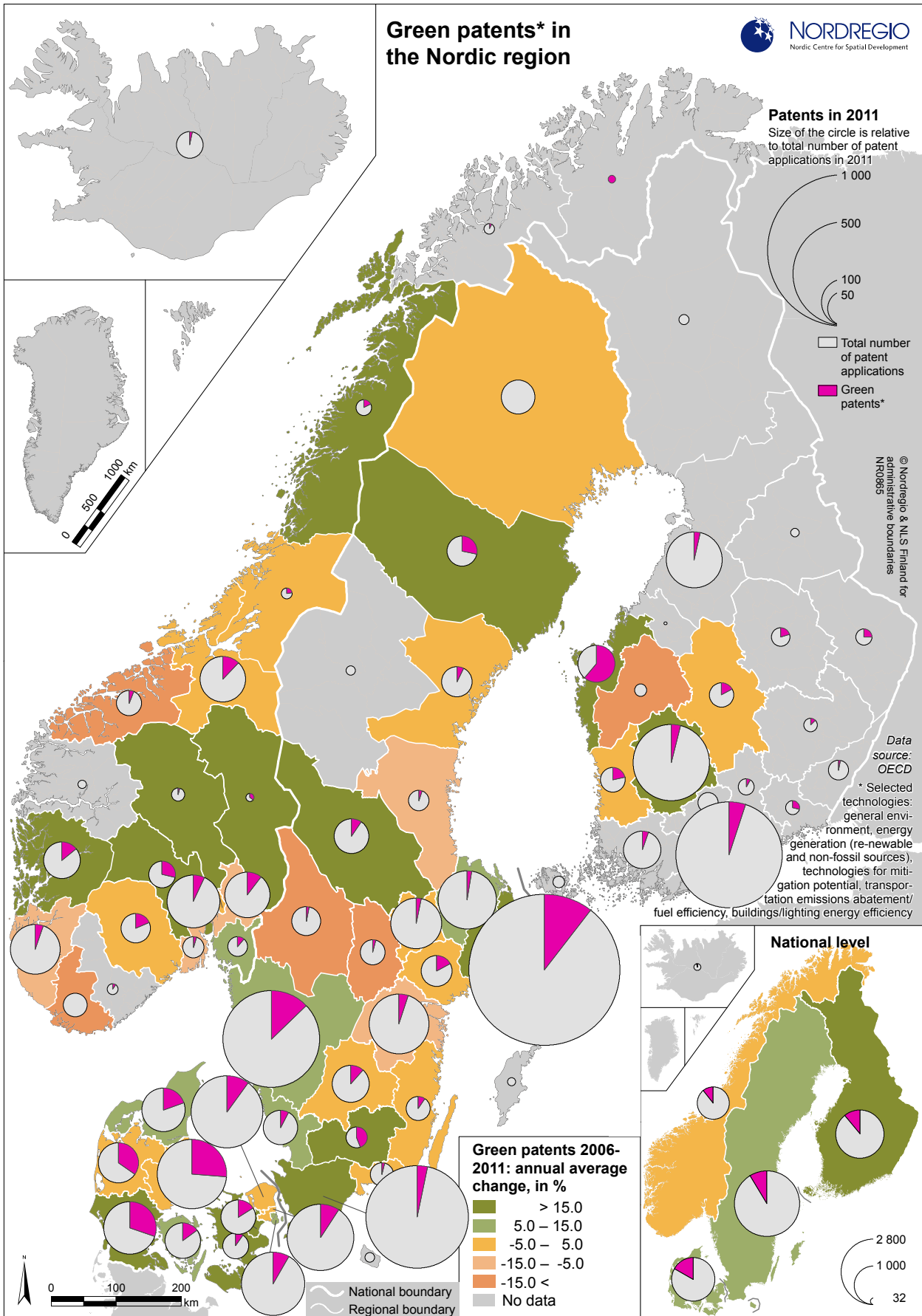


Figure 9.5: Green patents in the Nordic Region. Regions in which the number of green patents has been zero for at least two years during the period 2006-2011, or for which times series data were entirely missing, are coloured grey in the map

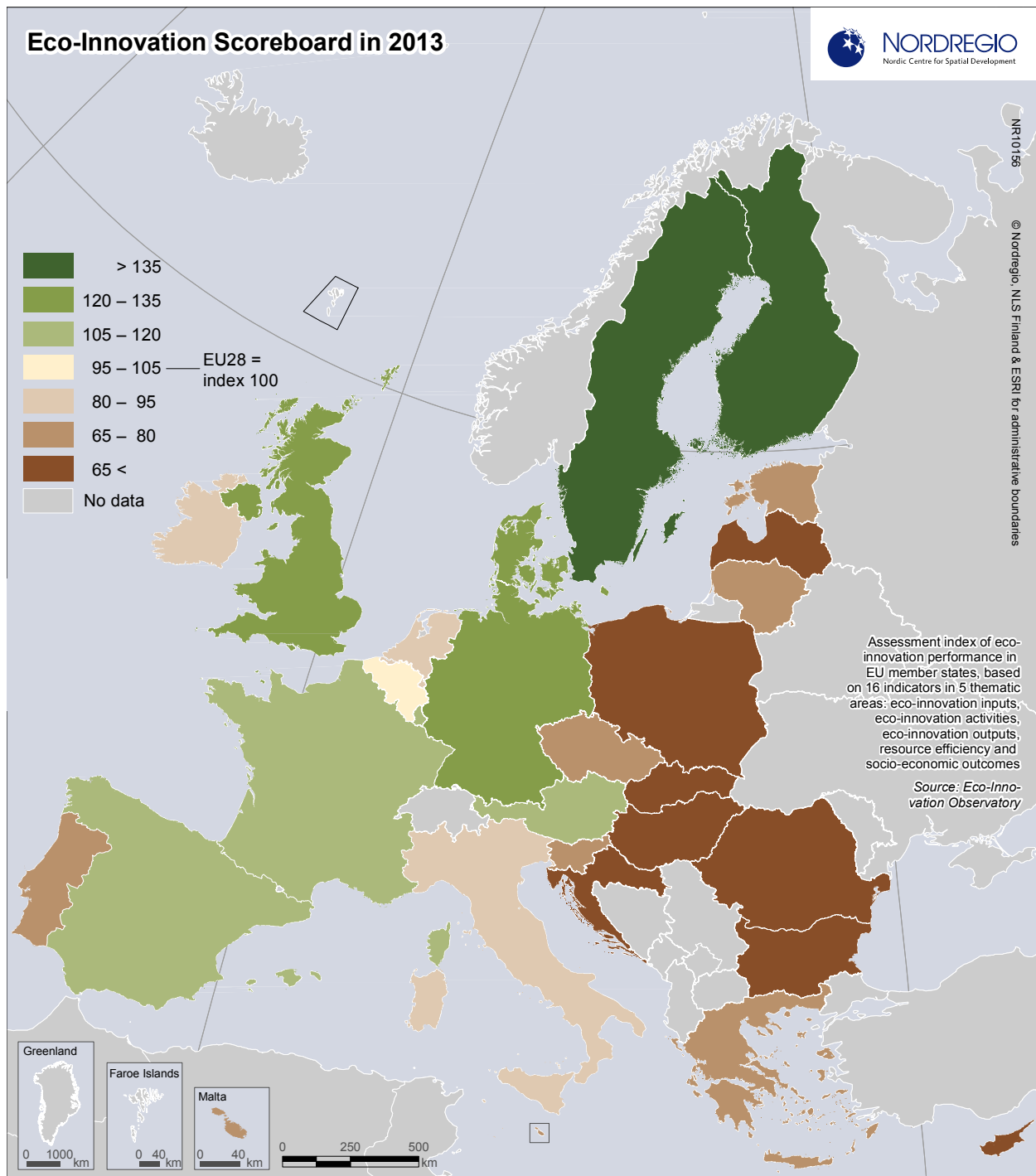


Figure 9.6: Eco-Innovation Scoreboard in 2013. Note: Finland: Includes Åland

tiveness of EU countries and aims to promote a holistic view of economic, environmental and social performance. It covers eco-innovation inputs, eco-innovation activities, eco-innovation outputs and resource efficiency and socio-economic outcomes.

The Faroe Islands, Greenland, Iceland and Norway are not however included in the Eco-innovation Score-

board, limiting the scope of our analysis. As such, the future introduction of a coherent Nordic eco-innovation index covering not just five Nordic countries, but also Åland, Greenland and the Faroe Islands would simplify and enrich the analysis by enabling a comprehensive analysis to be undertaken of the entire Nordic Region.

Concluding comments

In this chapter, we have explored innovation performance in the Nordic countries and regions and analysed the Nordic innovation capacity. Based on the data provided, a few concluding remarks are worth making to reemphasise the key points (note however that our analysis on Nordic innovation largely focuses on Finland, Sweden, Denmark, and Norway due to lack of innovation statistics for Iceland, Åland, Greenland and the Faroe Islands. In consequence, comparability is rather limited. Even for the largest countries in the Nordic Region, innovation data at the regional standard levels and applicable in an international context (e.g. harmonised) can be hard to find).

First, the Nordic countries and regions currently represent a good to excellent level of innovation performance compared to other European countries and their regions. The Nordic Regions in Sweden, Denmark, Finland, and Norway are either innovation leaders or innovation followers. For instance, despite sudden changes in the Finnish ICT sector in recent years, the overall level of innovation performance has not yet been affected during the period covered by this report. In the long-term, however, Finland is likely to face a significant challenge in its attempt to maintain the economic and innovation boost generated by Nokia. The Finnish government has recently proposed cutting state funding for universities and research institutes, something which will, it could be argued, only further deepen the crisis in Finland.

Second, innovation performance and the competitiveness of the Nordic Region is explained by the existence of good preconditions for research and development:

- relatively high workforce share of doctorates (e.g. Sweden ranks third in Europe);
- high levels of direct funding of business R&D. During the period 2007-2013, in the three capital areas of Oslo, Stockholm and Helsinki the level of business R&D investments has continuously increased, and there were several other regions where R&D investments also significantly increased. The statistics on R&D investments in the business sector in Iceland reflect the national economic crisis that occurred during the period peaking in 2009-2010.
- high employment levels in the knowledge intensive sectors (although with some variations across regions). The northern parts of Finland, Sweden and Norway however continue to lag significantly behind their southern counterparts in the respective countries.

Third, eco-innovation seems to be regionally 'scattered' across the Nordic countries. There are numerous regions with eco-innovation potential in Finland, Sweden, Denmark and Norway when measured by green patents. As we have seen, high shares of green patents are found in several regions even outside the big Nordic cities, e.g. Pohjanmaa (Finland), Østjylland, Vestjylland

The Nordic countries and regions currently represent a good to excellent level of innovation performance compared to other European countries and their regions.

and Sydjylland (Denmark), Buskerud (Norway) and Kronoberg and Västerbotten (Sweden). Moreover, in some Nordic Regions with a very small total number of patents, there are several cases where green patents predominate, e.g. Kymenlaakso and Pohjois-Karjala (Finland) and Finnmark and Hedmark (Norway). Regions with the largest population sizes and also a large number of total patents generally however do not have large quantities of green patents.

How does our analysis on innovation capacity and performance in the Nordic countries and regions reflect the Nordic reality in 2016? Despite some differences in economic performance across the Nordic countries, no significant changes in the overall level of Nordic innovation capacity and performance had become evident by the end of 2015. One explanation for this is that the Nordic countries are characterised by a robust knowledge-intensive industrial structure, which appears to be more resistant to crisis than those of some other European countries. Nevertheless, it is still too early to determine any significant long-term trends in this respect.

As for eco-innovation, it opens up new opportunities for both large city regions and peripheral/sparsely populated regions in the Nordic countries. To give an example, it is not economically efficient to transport biomass on long distances. Proximity of the natural resource base and production (MacCormick & Kautto, 2013) creates innovation opportunities for both the regions that are dependent on the natural capital and resource bases and those that are not characterised by the geographic 'immobility' of the primary factors in production. As such, Bio-economy related innovations take place both in the big Nordic cities with universities and research centres and at the sites where raw material is acquired.

Chapter 10

TOURISM:

A new economic driver?

Authors: Lise Smed Olsen & Timothy Heleniak

Maps and data by: Shinan Wang, Linus Rispling, Timothy Heleniak, Julien Grunfelder, Johanna Roto, Hjördís Rut Sigurjónsdóttir & Anna Berlina

Tourism has become big business and a key services export for many economies around the world. Tourism contributes to job creation and regional economic development (OECD, 2014).

The importance of the tourism industry for the Nordic economies has, moreover, mandated the development of national and regional tourism strategies across the region. Most of these strategies incorporate the principle of sustainable tourism development (see box).

The role of tourism in regional development strategies is particularly evident in rural and peripheral areas, where, as a result of the socioeconomic changes taking place, tourism is in many places viewed as a replacement industry for traditional rural livelihoods (Hall et al., 2009), or as a complement to traditional, often male-dominated industries. However, as it is also evident in this chapter, tourism plays a role in both the rural and urban areas of the Nordic Region. The reasons why tourists travel to the Nordic Region are many and include for example – nature-based experiences, coastal tourism, culture experiences, urban tourism, and business meetings and conferences. These types of tourism experiences do however vary significantly between regions.

Current trends in tourism, globally, point towards shorter trips, either domestic in nature or closer to home, and to a search for more ‘authentic’ experiences. Holidays remain by far the main reason for taking an international trip (71%) ahead of business travel and visiting friends and relatives. More people fly than use their cars or other means of transport (OECD, 2014:23).

As will become evident in this chapter, the highest shares of visitor numbers in most Nordic Regions are comprised by domestic tourists and visitors from neighbouring countries. One of the most popular ways of measuring tourism is to count the number of overnight stays. This approach will be utilised in this chapter. In the Nordic context, Iceland has experienced significant

Nowhere else in the Nordic Region have visitor numbers increased as much as in Iceland where the highest average growth of 176% was observed in Suðurnes.

growth in tourism numbers to destinations across the country during the period 2008-2014 while Swedish regions have also seen a remarkable growth in overnight stays during the same period. In 2014 the total numbers of overnight stays were highest in the region of Syddanmark, closely followed by those in the capital regions of Sweden and Denmark.

Iceland the stand-out in a mixed picture for overnight stays

Figure 10.1 illustrates the changes in overnight stays from 2008 until 2014. What immediately stands out on

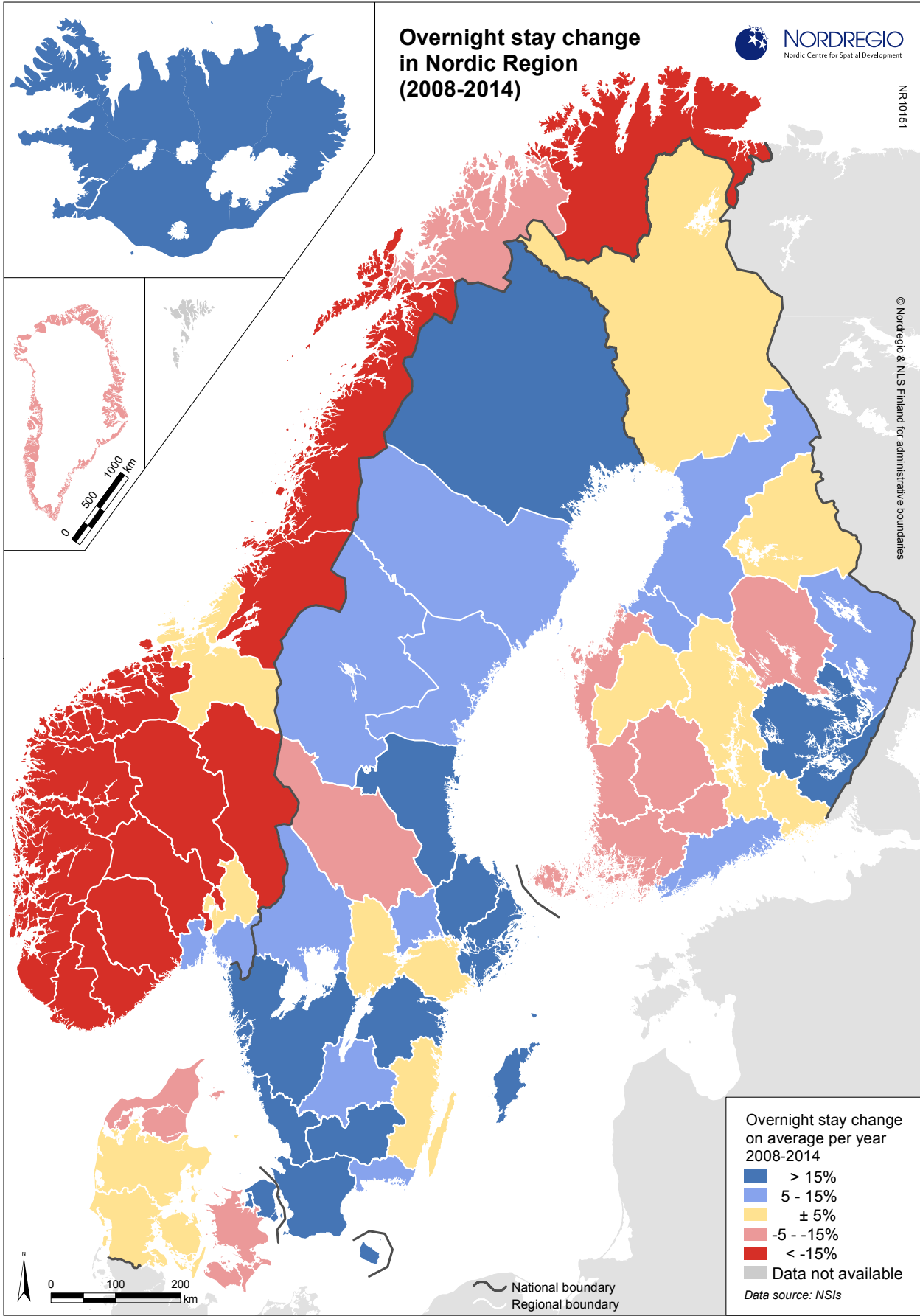


Figure 10.1: Overnight stay change in Nordic Region, 2008-2014. Faroe Islands: No data

Sustainable tourism development

The overall definition of sustainable tourism development as presented by the UNEP and UNWTO (2005) is: "Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities." Sustainability principles refer to ensuring a balance between environmental, economic, and socio-cultural aspects of tourism development.

Environmental sustainability refers to development that ensures preservation of biological processes, biological diversity and biological resources. The most significant environmental impact from the tourism industry is caused by transport and energy consumption in buildings. In describing the role of the tourism industry in the green economy, the OECD (2013:7) states: "Due to tourism's cross-cutting nature and close connections to numerous sectors at destination and international levels, even small improvements toward greater sustainability will have important impacts in the shift towards more sustainable, cleaner and low-carbon economic growth."

Economic sustainability involves ensuring that the revenue from tourism activity benefits, as far as possible, the destination itself and the regional economy more generally. The use of local products and the local labour force are important in strengthening the economic benefit from tourism. Socio-cultural sustainability refers to peoples' need to be in control of their own life, culture and the use of their surroundings. With growing tourism numbers the experience of the local population in popular destinations may become increasingly negative. As such, they should be involved as closely as possible in tourism infrastructure and strategy development (Kaae, 2011).

the map is that all of the Icelandic regions have experienced an average increase of 15% or more in overnight stays during the period 2008-2014. In fact, nowhere else in the Nordic Region have visitor numbers increased as much as in Iceland where the highest average growth of 176% was observed in Suðurnes, which is the region

In terms of regional development it is notable that all Icelandic regions have attracted tourists and thereby benefited from increased incomes.

where the international airport and the Blue Lagoon are located. Most Icelandic regions had an increase of more than 100% with the lowest increase of 62% in Vesturland. In terms of regional development it is notable that all Icelandic regions have attracted tourists and thereby benefited from increased incomes. After the Icelandic regions, the region of Etelä-Karjala in Finland has seen the largest increase in visitor numbers with an increase of 35% during the period 2008-2014. Thus, growth in tourism numbers has been substantial in Iceland compared to elsewhere in the Nordic Region.

The Icelandic tourism industry faced a number of significant challenges during the period, from the financial crisis in 2008 to the 2010 eruption of Eyjafjallajökull. These potentially negative events were however turned into a relative success story since the eruption made the news worldwide and fed into the award-winning "Inspired by Iceland" campaign. Further, the high growth of the tourism sector in Iceland is in large part due to the success of the so-called 'hub and spoke' model which was introduced by Icelandair in 1998 using Keflavik airport as its main hub. This has allowed Iceland to attract international visitors from a number of key geographic source markets by offering direct flights to an increasing number of destinations (Promote Iceland, 2013).

In Sweden also a number of regions have seen significant increases in visitor numbers, including the northernmost region of Norrbotten, and the regions of Skåne, Västra Götaland, Halland, Kronoberg and Gotland in the south. Gävleborg, Uppsala and the capital region of Stockholm also experienced an increase of more than 15% in overnight stays. Generally, there has been an upward trend in overnight stays in Sweden. Moreover, although Dalarna witnessed the largest average decline in tourist numbers - some 9% - during the period 2008-2014

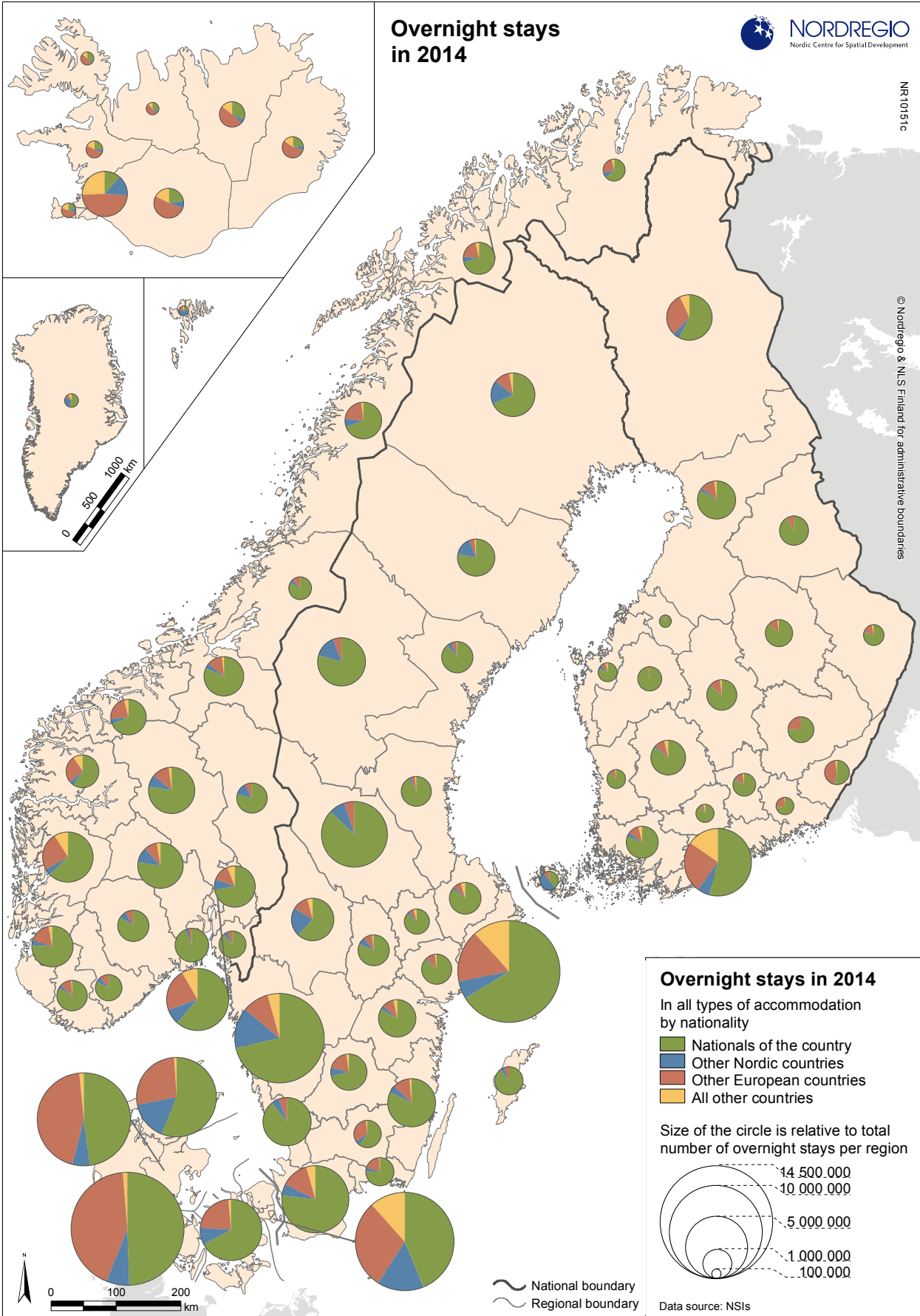


Figure 10.2: Overnight stays in 2014

Looking at the number of overnight stays, the highest numbers are found in the region of Syddanmark in Denmark with more than 14 million in 2014.

it nevertheless remains one of the most visited regions in Sweden. The increasing number of airlines operating routes into the country has been highlighted as one of the primary contributing factors to the growth of tourism in Sweden.

A more varied development is evident in Finland. Here the two regions located in the south eastern part of the country, Etelä-Karjala and Etelä-Savo are the only regions witnessing increases of more than 15% in overnight stays during the period in question. The regions of Pohjois-Karjala, Keski-Pohjanmaa, Pohjois-Pohjanmaa, and Uusimaa saw increases in overnight stays of between 5-15%, while a number of regions had either a small increase or decrease in visitor numbers. The most significant downward trend was seen in Kanta-Häme with -14%. Åland also experienced an average decrease in overnight stays of -14%.

A rather different picture is evident in Norway where the majority of regions have seen an average decrease in overnight stays of more than 15% during the 2008-2014 period, with the most substantial being in Sogn og Fjordane with a change of -48%. Visitor numbers in the capital region of Akershus and Sør Trøndelag have seen a slight decline while Østfold and Vestfold neighbouring Akershus are the only regions that have witnessed an increase in visitor numbers of 14% and 7% respectively over the period. This can in part be explained by the problems caused by the financial crisis combined with high exchange rates for the Norwegian Krone during this period.

In Denmark, the capital region has seen a substantial average growth of 29% in overnight stays during 2008-2014. The regions of Syddanmark and Midtjylland have seen a slight upward trend in overnight stays, whereas the opposite trend has been evident in Nordjylland and Sjælland.

Regional data is not available for Greenland, but from the national average, the country has experienced an average decline of 11% in overnight stays during 2008-2014. Data is not available for the Faroe Islands.

Figure 10.2 provides an overview of the number of overnight stays in all types of accommodation in 2014 and the nationality of the tourists. First, looking at the number of overnight stays, the highest numbers are found in the region of Syddanmark in Denmark with more than 14 million in 2014, where LEGOLAND is a flagship destination, followed by the capital regions of Sweden and Denmark (both more than 11 million). Generally, in national comparison, the capital regions have the highest numbers of overnight stays in the Nordic Region. Particularly high visitor numbers are also found in the region of Midtjylland in Denmark and Västra Götaland in Sweden both with more than 9 million overnight stays in 2014. In reference to figure 10.3 it is interesting to note that although regions such as Finnish Lapland and Dalarna in Sweden, both important winter tourism destinations, have experienced a downward trend in overnight stays in the period 2008-2011, they have maintained high visitor numbers in a national comparison.

Tourist diversity concentrated in hot spots

Looking at the origin of the tourists it is evident that the share of international tourists is generally higher in Iceland compared to the rest of the Nordic Region. The Faroe Islands had the highest share of 72% of overnight stays by nationals from other Nordic countries in 2014. More than half of the tourists with overnight stays in Greenland were Danish nationals. For most regions in Norway, Sweden and Finland the share of overnight stays of nationals from their own country comprised more than two thirds of the totals in 2014. An exception to this is found in the most visited regions that have a slightly higher share of international tourists. In Denmark the three regions with the highest visitor numbers have more than 50% international visitors.

Figure 10.3 shows the number and national distribution of international tourists, excluding, domestic tourists, in 2014. Interestingly, with the exception of the capital region, all regions in Denmark have a dominant share of German tourists, particularly Syddanmark and Midtjylland. Coastal tourism, especially along the west coast of Denmark, is a significant attraction for German tourists. Similarly, a number of regions in Finland had a dominant share of Russian tourists in 2014, particularly Etelä-Karjala and Etelä-Savo which also had the highest growth in visitor numbers in Finland during the period 2008-2014. In the southern part of Sweden, German tourists also comprise a large share of the in-

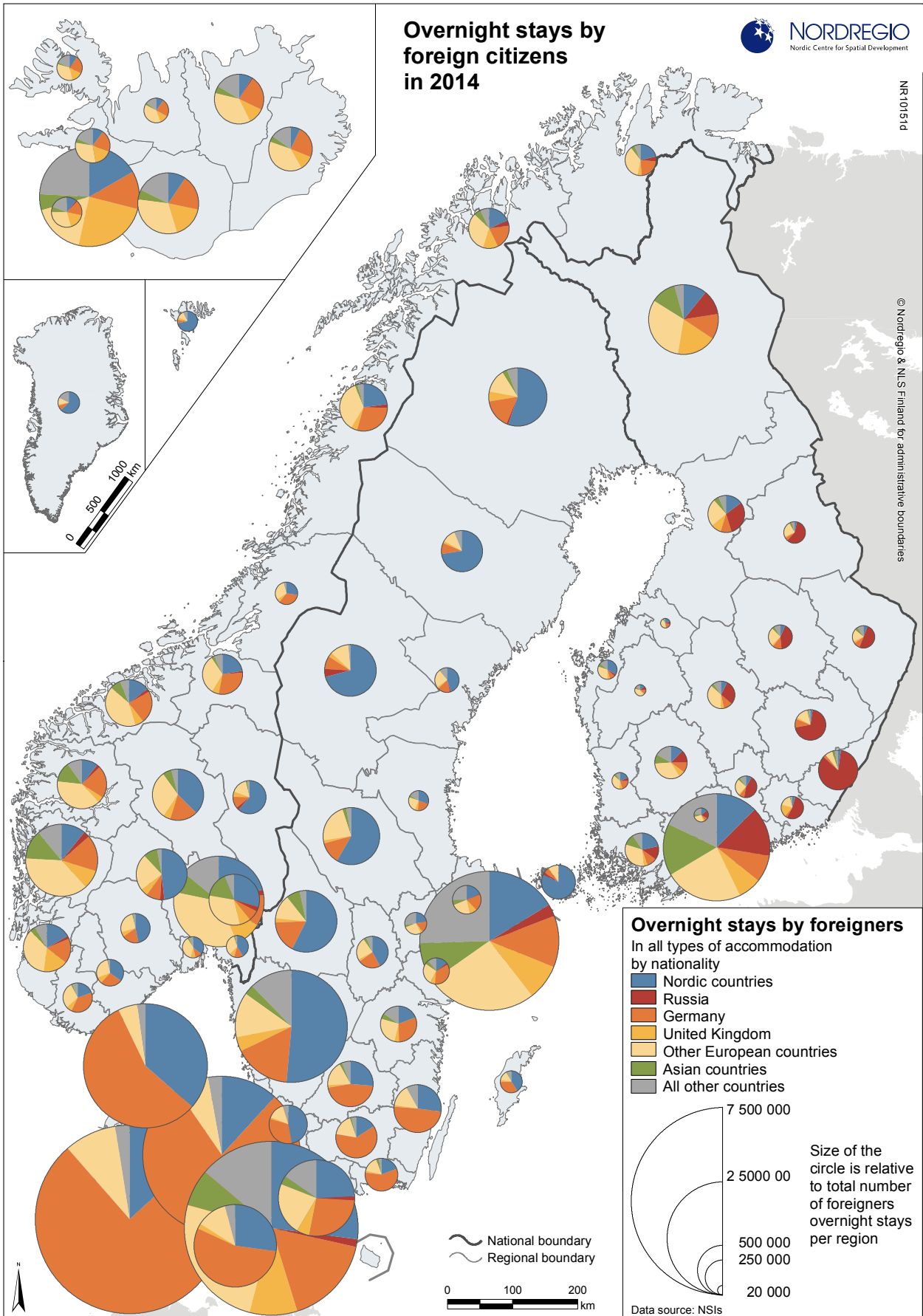


Figure 10.3: Overnight stays by foreign citizens in 2014

ternational tourists, whereas most regions in the rest of the country have a high share of tourists from the other Nordic countries. Norwegian nationals comprised the largest share of international overnight stays in Sweden in 2014, most of them in regions bordering Norway (Tillväxtverket, 2015). In Norway a clear trend is that a large share of the international tourists are from other European countries. The largest numbers of overnight stays are still nevertheless made by visitors from Sweden and Denmark (Innovasjon Norge, 2015). Generally, the capital regions and their neighbouring regions have the most even mix between the different categories of international tourists. Other regions attracting a varied mix of international tourists, including Asian and 'all other' countries, are located either in Iceland, along the Norwegian coastline, or in Finnish Lapland.

Cruise Tourism is increasing in the Nordic Region

Cruise tourism is a form of mass tourism, and as such it has a number of implications in terms of sustainable tourism development, especially in smaller rural destinations. Cruise tourism involves the short-term daily influx of large numbers of people, which can lead to negative experiences for both local residents and land-based tourism. Cruise tourism in a sense is a competitor to land-based tourism because the cruise ships become a substitute for air travel, they provide accommodation, food, and activities. In some cases, because the ships are destinations in themselves, passengers will even choose to stay on board the vessel instead of disembarking. While cruise tourism brings in more visitors the economic impact is relatively small and usually concentrated to a few actors (Brida & Zapata, 2010; Klein, 2011). However, especially in the Arctic, the remoteness, isolation, small populations and lack of infrastructure makes some destinations difficult to develop, and while it can be seen as a competitor to land-based tourism, cruise tourism can also be seen as a supplement to small destinations that are not yet mature enough to fully support land-based tourism (Fay & Karlsdóttir, 2011).

Figure 10.4 shows the number of cruise ship calls to the Nordic and Baltic Sea regions in 2014 and the annual average change in passenger numbers from 2011 to 2014 (with the exception of Greenland where only data from 2015 is available). The map only includes international cruise ship passengers and calls. It does not show regular, scheduled ferry connections such as Hurtigruten in Norway. The development in the Nordic Arctic region is introduced first, followed by the Baltic Sea region (Northern Norway, Norrbotten and Finnish Lapland are here included as part of the Arctic).

Cruise tourism can be seen as a supplement to small destinations that are not yet mature enough to fully support land-based tourism.

Nordkapp in Northern Norway received the most passengers in 2014 in the Nordic Arctic. Nordkapp received 122 000 passengers from 109 ports of call. In Northern Norway, cruise ship tourism is centred on a few ports, the largest, in terms of passenger numbers, also include Tromsø (112 000 passengers), followed by Leknes (60 000 passengers). Longyearbyen in Svalbard had 37 100 passengers in 2014, and is another destination with a clear upward trend in passenger numbers in the period 2011-2014.

In Iceland the largest cruise ports in 2014 in terms of passengers were Reykjavík (105 000 passengers from 91 ports of call), Akureyri (73 000 passengers), and Ísafjörður (40 000 passengers). An upward trend can be observed for all three destinations in the period 2011-2014. A number of other cruise tourism destinations exist around the Icelandic coastline, and most have seen increasing visitor numbers.

In the Faroe Islands, Torshavn is the primary destination for cruise ships with the highest number of the 35 calls in 2014. Passenger data for the Faroe Islands is only available at the national level. The Faroe Islands have seen an average increase of more than 10% in passenger numbers during the period 2011-2014.

Cruise ships visited almost 20 cruise destinations across Greenland in 2015. Major ports in terms of number of calls (above 40) in 2015 were Ilulissat, Maniitsoq and Kangerlussuaq. In addition, Uummannaq, Qeqertarsuaq, Qaqortoq and Nuuk had more than 20 calls per port. Qaqortoq had the most passengers, almost 14 000 from 23 ports of call, while Ilulissat had the highest number of 51 ports of call but a total of 8600 passengers, indicating that Qaqortoq receives larger cruise ships.

In the Baltic Sea region, in terms of passenger numbers, Copenhagen was the largest port in 2014 receiving a total of 740 000 cruise tourists (from 313 ports of call), followed

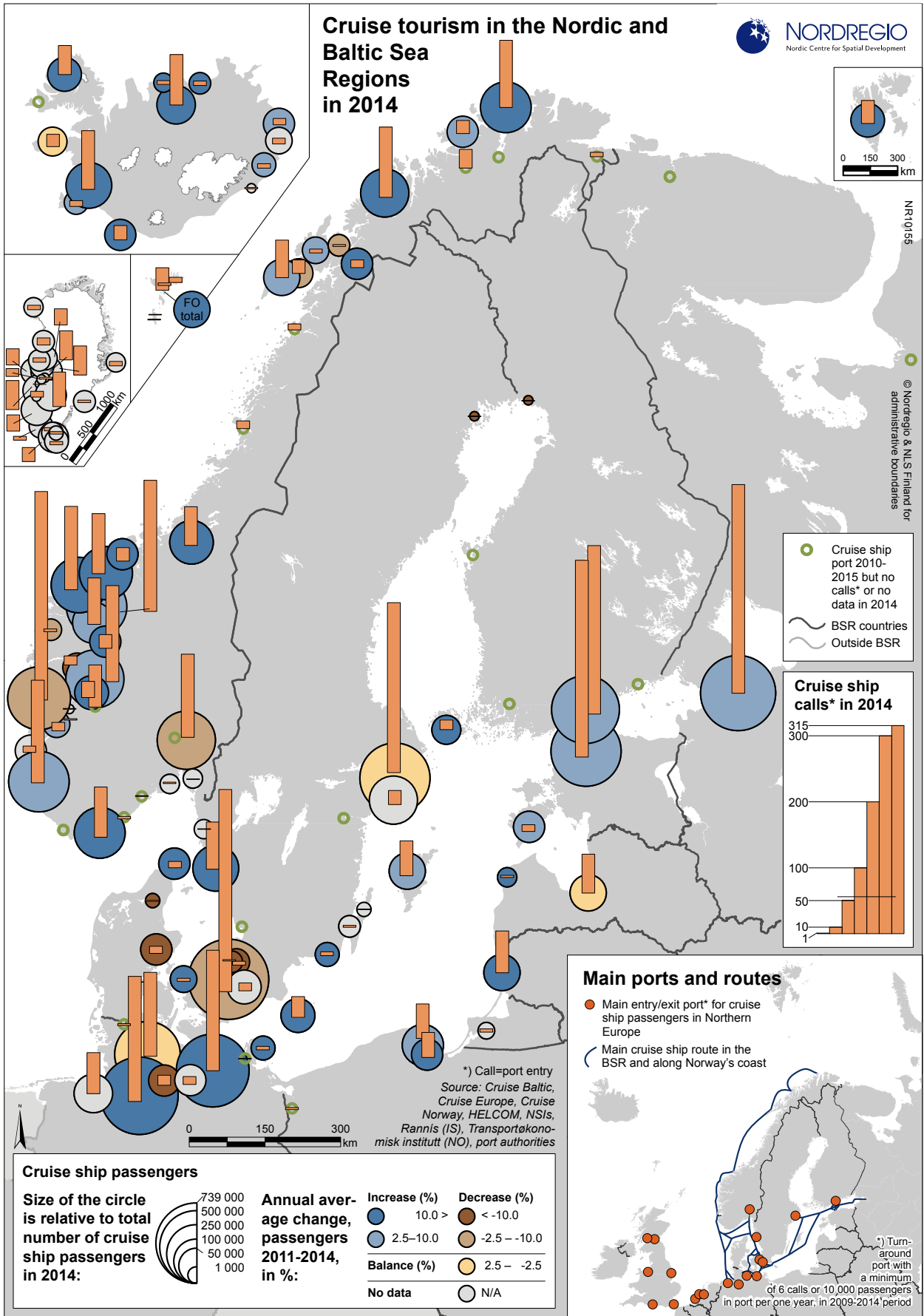


Figure 10.4: Cruise tourism in the Nordic and Baltic Sea Regions in 2014

by Hamburg and St. Petersburg. Stockholm with 470 000 passengers and Helsinki with 420 000 passengers were also popular cruise tourism ports in 2014. In the southern part of Norway the main concentration of cruise calls is to be found along the west coast with Bergen a particularly popular destination with 323 000 passengers in 2014, followed closely by Geiranger and Stavanger. Overall, the highest passenger numbers in the Baltic Sea Region are to be found in the capitals and other urban areas. Most places have seen an upward trend in the period 2011-2014.

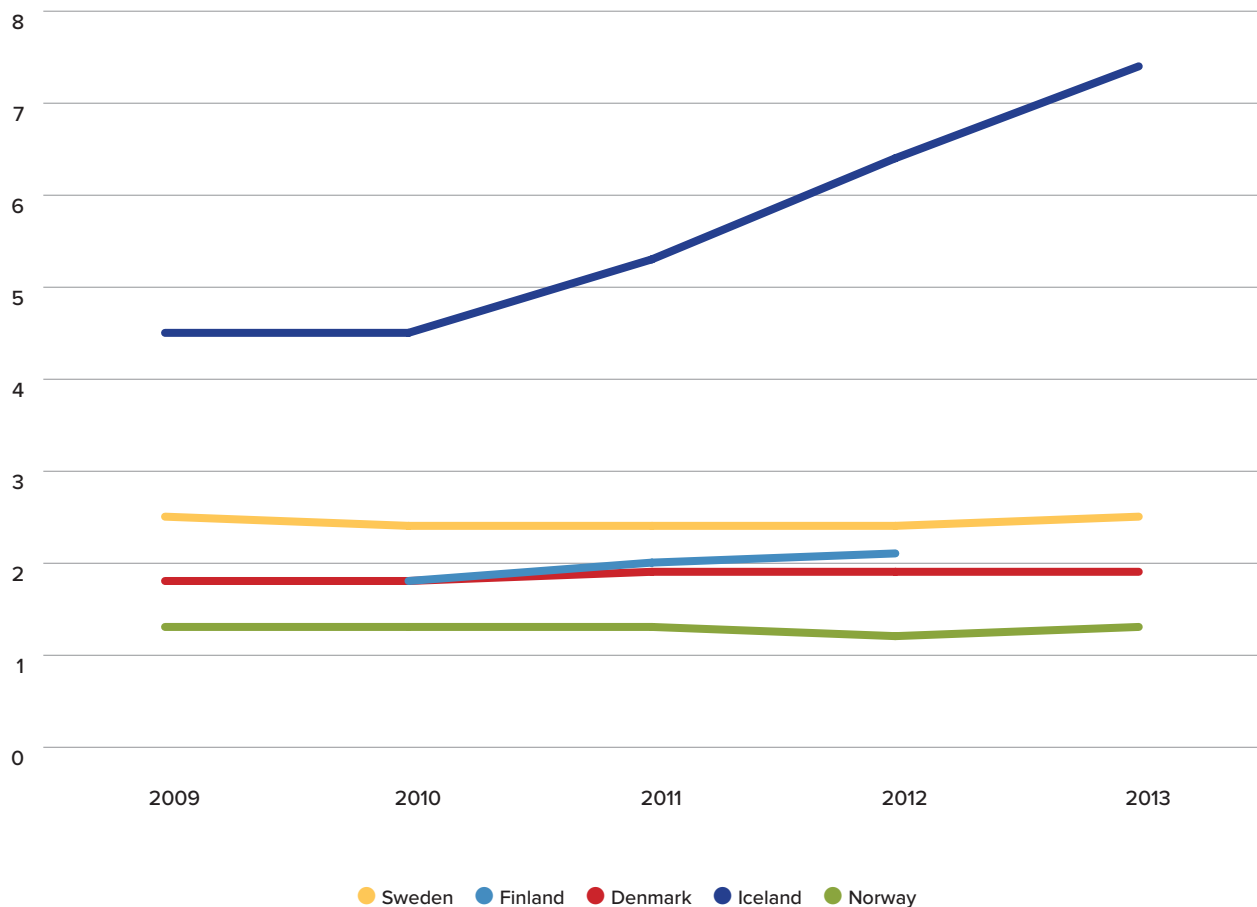
The bottom right corner map of figure 10.4 indicates the main ports and routes in the Baltic Sea region. The ports marked with red are the main entry and/or exit ports for cruise ship passengers in Northern Europe. In these cities cruise ship passengers will often stay for a longer time, and local revenue from cruise tourism will thus also be higher. Several of the most important of these cruise tourism entry/exit points, often referred to as turnaround ports, are located outside the Nordic Region, but serve as a starting or ending point for cruises that include short stopovers in Nordic ports in their itin-

eraries. Although Nordic destinations like Oslo, Gothenburg, Copenhagen, Malmö, Stockholm and Helsinki are also important entry/exit points for cruises in Nordic waters, major turnaround ports in the United Kingdom, the Netherlands or Germany remain the primary competitors to these Nordic ports.

Macroeconomic impact of tourism in the Nordic countries

The Tourism Satellite Account (TSA) is a standard statistical framework and the main tool for measuring the weight of tourism from a macroeconomic perspective. It focuses on the description and measurement of tourism in its different components (domestic, inbound and outbound). It also highlights the relationship between consumption by visitors and the supply of goods and services in the economy, principally those from tourism industries. With this instrument, it is possible to estimate tourism GDP, and to establish the direct contribution of tourism to the economy (OECD, 2014).

Figure 10.5: Tourism as a share of GDP, 2009-2013



The growing importance of tourism for the Icelandic economy is reflected in macroeconomic indicators related to tourism such as inbound tourism as a percent of GDP. For the other Nordic countries, tourism as a share of GDP is between 1.0 and 2.5 percent and has shown little increase. In Iceland, inbound tourism expenditure as a share of GDP increased from 4.5 to 7.4 percent between 2009 and 2013 (figure 10.5). Only in Iceland, is tourism's share of GDP above the average for all OECD countries where in 2012, tourism made up 4.7 percent of GDP (OECD, 2014).

Concluding comments

This chapter has shed light on the development in the statistics on overnight stays in the Nordic Region, which demonstrated that Iceland has experienced an extensive growth in tourism numbers throughout the country in the period 2008-2014. Swedish regions have also seen a remarkable growth in overnight stays during this period.

In 2014 the total numbers of overnight stays were highest in the region of Syddanmark, closely followed by the capital regions of Sweden and Denmark. Tourism numbers in Denmark (with the exception of the capital region) are strongly supported by, and dependent on, the neighbouring German market. Similarly, in 2014 Finnish regions, particularly in the eastern part of the country, saw high visitor numbers from Russia.

Following domestic tourists, who generally constitute the largest group in terms of overnight stays, are nationals from elsewhere in the Nordic Region. This is particularly evident in the Faroe Islands.

In addition to overnight stays, tourism numbers also include cruise tourism, which has been growing in recent years across the Nordic Region. Nordkapp is the most visited destination in the Nordic Arctic region while Copenhagen is the most visited in the Baltic Sea region. Cruise tourism as a form of mass tourism has been noted to have implications in terms of sustainable tourism development, especially in remote, sparsely populated areas. For remoter destinations, for example in Greenland, cruise tourism can however be viewed as a significant supplement to land-based tourism.

Iceland in particular has been successful in attracting a mix of international tourists, which has in part been explained by the launch of its comprehensive branding strategy. The Nordic Council of Ministers has also recently launched a common branding strategy based on the realisation that the outside world defines the Nordic Region as one unit (and one destination), and the further away, geographically, potential tourists are located the more this is the case (Nordic Council of Ministers, 2015). At the regional level, based on a similar realisation about the cross-border region, a common

Iceland in particular has been successful in attracting a mix of international tourists, which has in part been explained by the launch of its comprehensive branding strategy.

branding initiative, co-funded by Interreg, has been initiated by the regional destination management organisations in Northern Norway, Norrbotten and Finnish Lapland called Visit Arctic Europe. The purpose of the project is to develop new "product packaging solutions" across the borders and to develop approaches designed to promote joint marketing (Olsen et al., 2016).

While the volume of tourists visiting a region provides an indication of the implications for local job creation, this chapter has not provided an overview of the significance of tourism for regional economies and jobs. A primary challenge here is the very nature of the tourism industry as it overlaps different economic sectors thus complicating data collection. Another specifically Nordic challenge here is that when using regional data from national statistical institutions this data must either be directly comparable across all Nordic countries or it must allow for data harmonisation. In reality however it is often the case that the regional economic impact of tourism is not uniformly documented across the Nordic countries making direct comparisons problematic. However, in different ways the regional economic impact of tourism is being documented in the Nordic countries (see for example VisitDenmark, 2015).

Those areas that could be highlighted as having specific potential for Nordic collaboration on tourism development include common destination marketing initiatives to attract international tourists and, as tourism grows, efforts to ensure that it does so in an environmentally, socially and economically sustainable manner. In addition, the more widespread use of indicators to understand the regional economic impact of tourism in the Nordic Region may be helpful for future tourism policy development.

Green housing and infrastructure investments key to energy revolution

The way we live and travel is at the heart of the future energy revolution. As such, this edition of State of the Nordic Region includes chapters on housing and air accessibility as a compliment to the energy chapter. The Nordic Region is a global leader in combining ambitious climate and energy policy with steady economic growth. This position is largely the result of an abundance of hydro, nuclear and geothermal energy sources and ambitious, long-term and stable policy frameworks focused on decoupling GDP from CO₂. Although this is of course positive, it is important to acknowledge that the majority of these gains have been absorbed by an increase in the absolute demand for energy, particularly in the buildings and transport sectors. As a result, continued action that takes a multipronged approach to energy challenges is required. While renewing our energy consumption we need to bear in mind that providing appropriate and accessible infrastructure is also vital to supporting strong economic growth.

Property has been steadily increasing in value over the past 10 years with increases in all of the Nordic countries surpassing the EU average by a substantial margin. These increases are perhaps a reflection of the failure of new construction rates to keep up with demand, particularly in the larger Nordic cities. Nordic countries have different supplement systems for housing provision, but, as yet, none have managed to address the increasing problem of housing shortage and high property prices in Nordic cities.

Air travel is also increasing in all of the Nordic countries. One explanation for this growth is the way that some airports in the Nordic Region have used their peripheral location in a European context as a strategic advantage and become a gateway to other continents. Rail links between airports and city centres have also improved the accessibility of air transport in Copenhagen, Stockholm, Oslo and Helsinki. Substantial opportunity to continue this growth is apparent in the vast majority of airports in the Nordic Region. This has important implications for economic development in both the major cities and more remote regions, but also for the environment.

Theme 4
INFRASTRUCTURE

Chapter 11.

THE FUTURE OF NORDIC CLIMATE AND ENERGY

Authors: **Ryan Weber** and **Benjamin Donald Smith**
 Maps and data: **Gustaf Norlén**, **Shinan Wang** and **Benjamin Donald Smith**

This chapter was written in collaboration between Nordregio and Nordic Energy Research. Indicators on the Nordic Energy Research website provide an overview of the key energy trends in the Nordic Region <http://www.nordicenergy.org>

The need for energy management is clear. It sets the basic conditions across the globe for societal well-being and defines the parameters for economic growth. This, combined with global attention on climate change in the wake of COP21 and the continuing challenge of maintaining energy security, has placed energy at the forefront of the global political agenda. The Nordic Region has emerged as a global leader in combining ambitious climate and energy policy with steady economic growth. Despite this, room for improvement remains, particularly with respect to the transport and building sectors and in terms of the potential benefits of further Nordic cooperation. This chapter begins by outlining both the current position and the path that is already laid out for us as regards our energy and climate goals. An overview is then provided of a select number of dimensions with respect to the energy sector viewed from a Nordic spatial perspective, including energy production and consumption, with a focus on low-carbon energy. We conclude by exploring the Nordic electricity trade, as well as a number of future developments set to deliver us towards a low carbon energy future.

Is a fossil free future possible?

Figure 11.1 reflects a long-term trend across the Nordic countries - steady growth in GDP combined with flat growth in energy consumption, resulting in a reduction in the energy intensity of the economy. For instance, Denmark has a low ratio in both Figure 11.1 and 11.2 due to its proactive energy efficiency measures, lack of energy intensive industries and increased use of wind and biomass in electricity and heat production. Iceland is the exception here as it uses its abundant geothermal

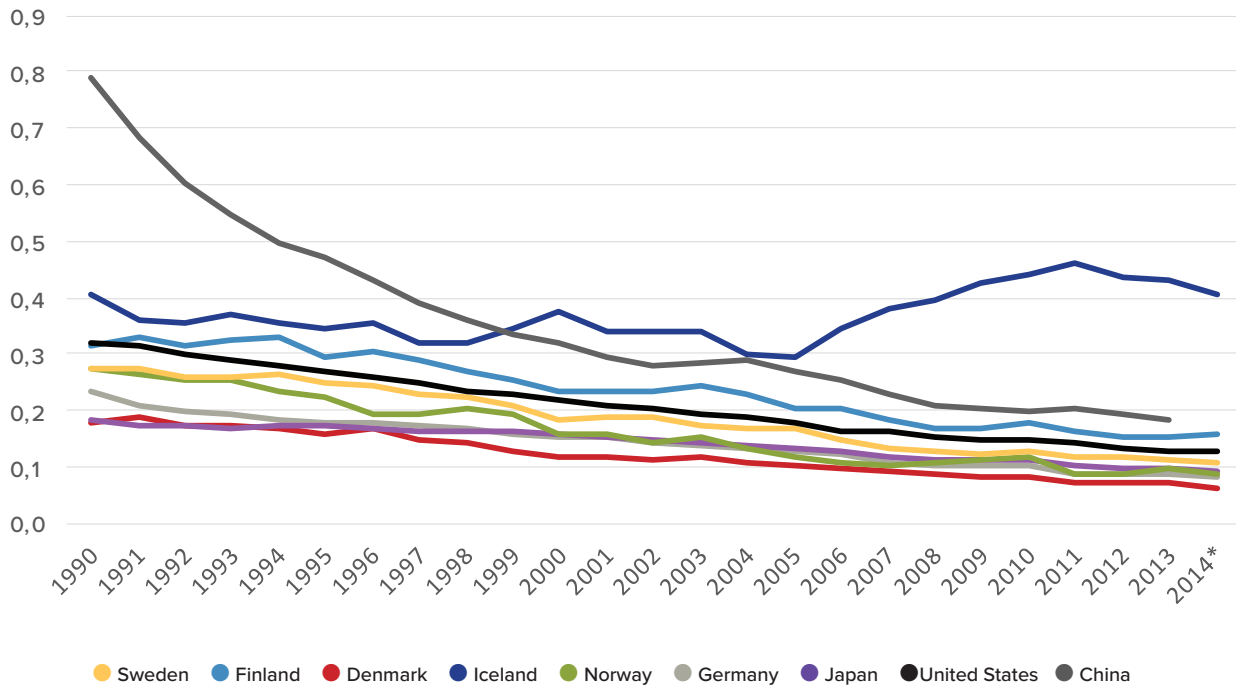
The Nordic Region has emerged as a global leader in combining ambitious climate and energy policy with steady economic growth.

energy for heating and has little need for energy efficiency measures. As such, its growing energy intensity over the last decade reflects the increasingly dominant role of energy intensive industries such as aluminium smelting in its small economy. Given, however, that all of the country's electricity and 81% of its energy supply is renewable, an energy intensive industry is a smart approach for exporting its plentiful clean energy resources. At the same time, this model is currently under scrutiny as negotiations for a high capacity grid connection to the UK have recently gathered momentum.

In terms of the measure of carbon intensity with respect to electricity production, the Nordic Region is effectively 25 years ahead of the global trend - measured in CO₂ emissions per unit of electricity generated. This is crucial assuming that if the 2-degree reduction target is achieved, the global carbon intensity rate in relation to electricity will reach the current Nordic level in 2039

Figure 11.1: Energy Intensity of GDP

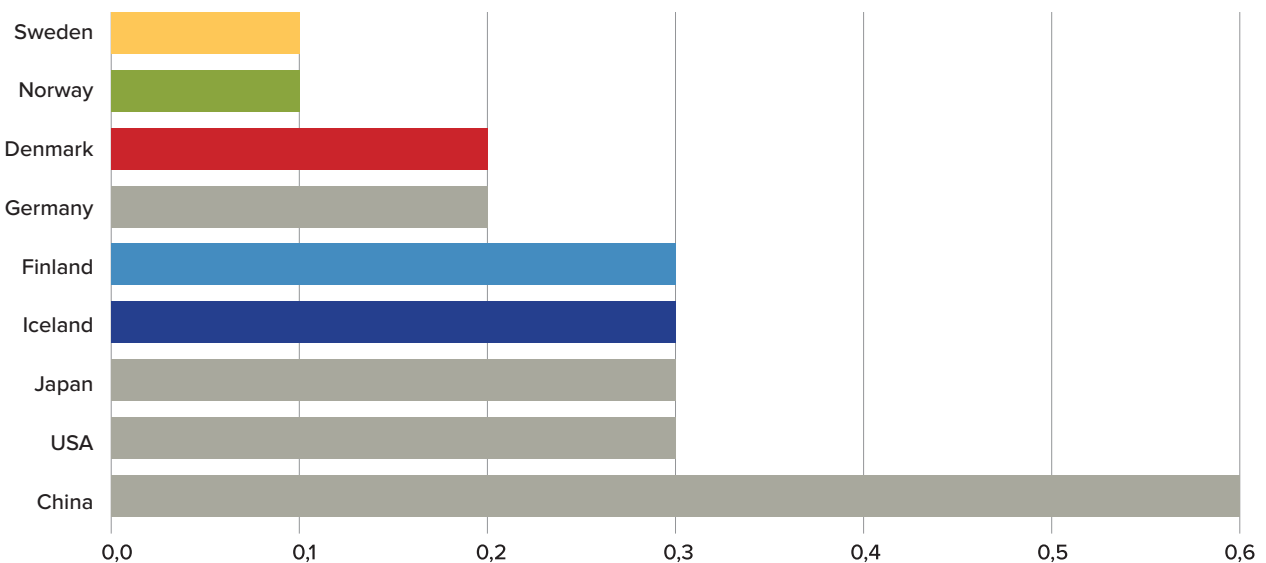
Total primary energy supply (ktoe, IEA) / GDP (million 2015 USD, PPP, World Bank)



Energy Intensity of GDP: energy intensity is a measure of the energy efficiency of economic output, in this case shown by the total primary energy supply (in kilotons of oil equivalent) per million USD GDP (in 2015 USD, using Purchasing Power Parity). Most Nordic countries have achieved gradual improvements in energy intensity while retaining energy-intensive industries.

Figure 11.2: CO2 intensity of GDP 2014

kg CO2 per \$ 1 of GDP (PPP, 2015 USD)

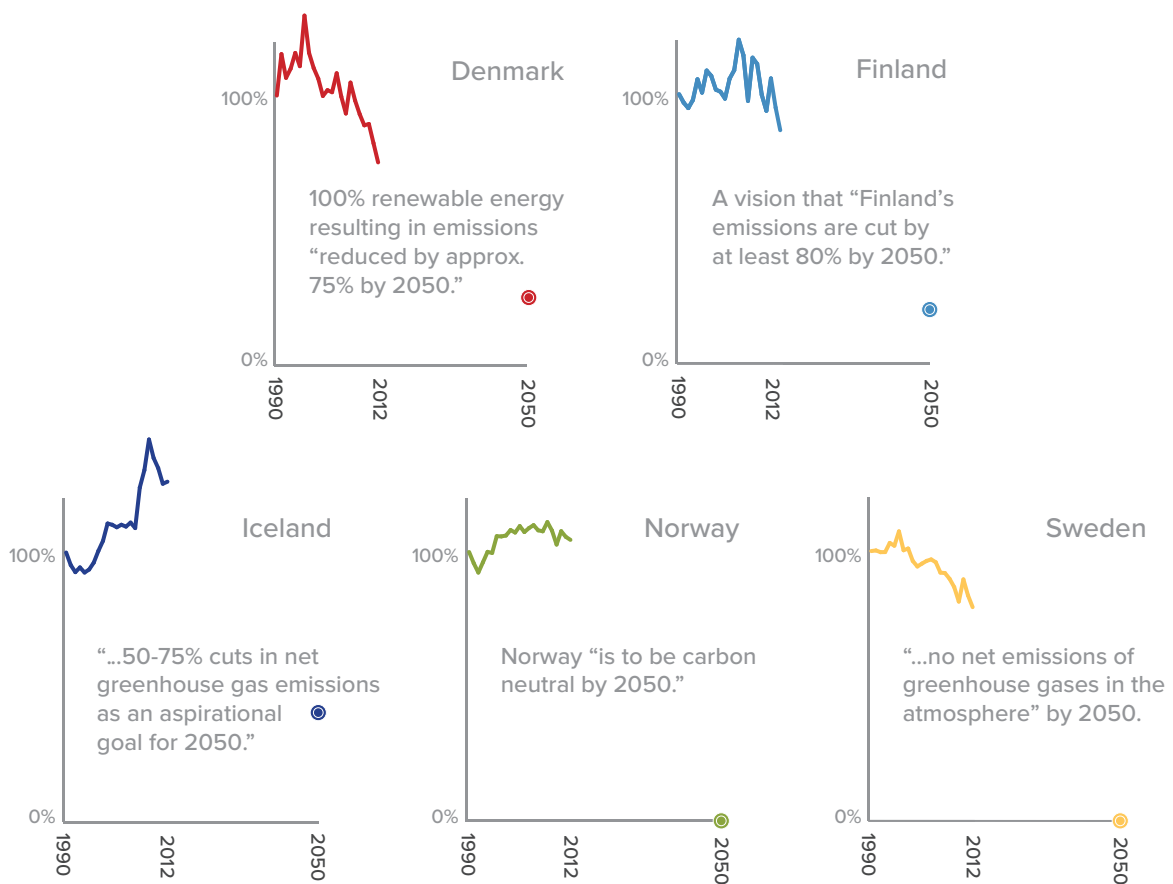


2014: the CO2 intensity of GDP is a measure of the CO2 emitted from fossil fuel use and industrial processes for every dollar of GDP. Despite a heavy reliance on energy-intensive industries, the CO2 intensity of the Nordic economies is generally lower than the major OECD economies. This is primarily due to low shares of fossil fuels in the energy mix. Iceland's intensity is highest in the region due to process emissions from aluminium production.

Data source: Nordic Energy Research, IEA (TPES) and World Bank (GDP). Note: Finland: Includes Åland, Greenland and Faroe Islands; No data. *Preliminary data for TPES in 2014

Data source: Nordic Energy Research, European Commission / EDGAR (CO2) and World Bank (GDP). Note: Finland: Includes Åland, Greenland and Faroe Islands; No data

Figure 11.3: Nordic climate targets



Nordic climate targets: domestic greenhouse gas emissions indexed to 1990. 2050 targets may be achieved using carbon offsets.

(IEA, 2014). Similarly, Figure 11.2 shows the CO₂ intensity of selected national economies, providing a useful measure of their economic-environmental efficiency. The strong position of the Nordic countries compared to others such as China and the United States reflects, in part, their use of hydropower and nuclear power, recent additions to the energy mix, such as bioenergy and wind power.

The carbon intensity of electricity production or the fossil fuel intensity of the economy does not however tell the whole story. For example, measures of energy or CO₂ intensity do not reflect our globalised economies with their significant levels of trade in goods and services, labour, energy and capital. This means that the connection between a country's economy and its energy system can be seen to be weakening when in fact energy consumption now takes place internationally rather than domestically. Countries that consume the metals refined using energy intensive processes in Iceland are a perfect example of this. In addition, as can be seen below, sectors

such as transport, building and industry have high consumption levels, particularly of non-renewable energy. This means that considerable progress is required if we hope to reach our exemplary energy and climate goals set out in Figure 11.3. Only by making sustained progress towards these goals will we be able to consider ourselves as global leaders across the spectrum of aspects that truly define energy and climate progress

In short, fossil fuels still make up 45% of Nordic total primary energy supply. Meeting our collective goals by 2050 will require the reduction of this number to just 16% (IEA/NER, 2013). This is possible, but only through comprehensive demand management and by increasing the share of renewables. The high level of energy demand from the industrial sector in the Nordic Region also presents a substantial challenge. Currently, industry makes up 38% of the Nordic energy demand. This is well above the OECD average and constitutes the bulk of large Nordic point source emissions of CO₂ (see Figure 11.4). For example, Figure 11.5 shows that, in sharp con-

Figure 11.4: Large CO2 point sources, 2011

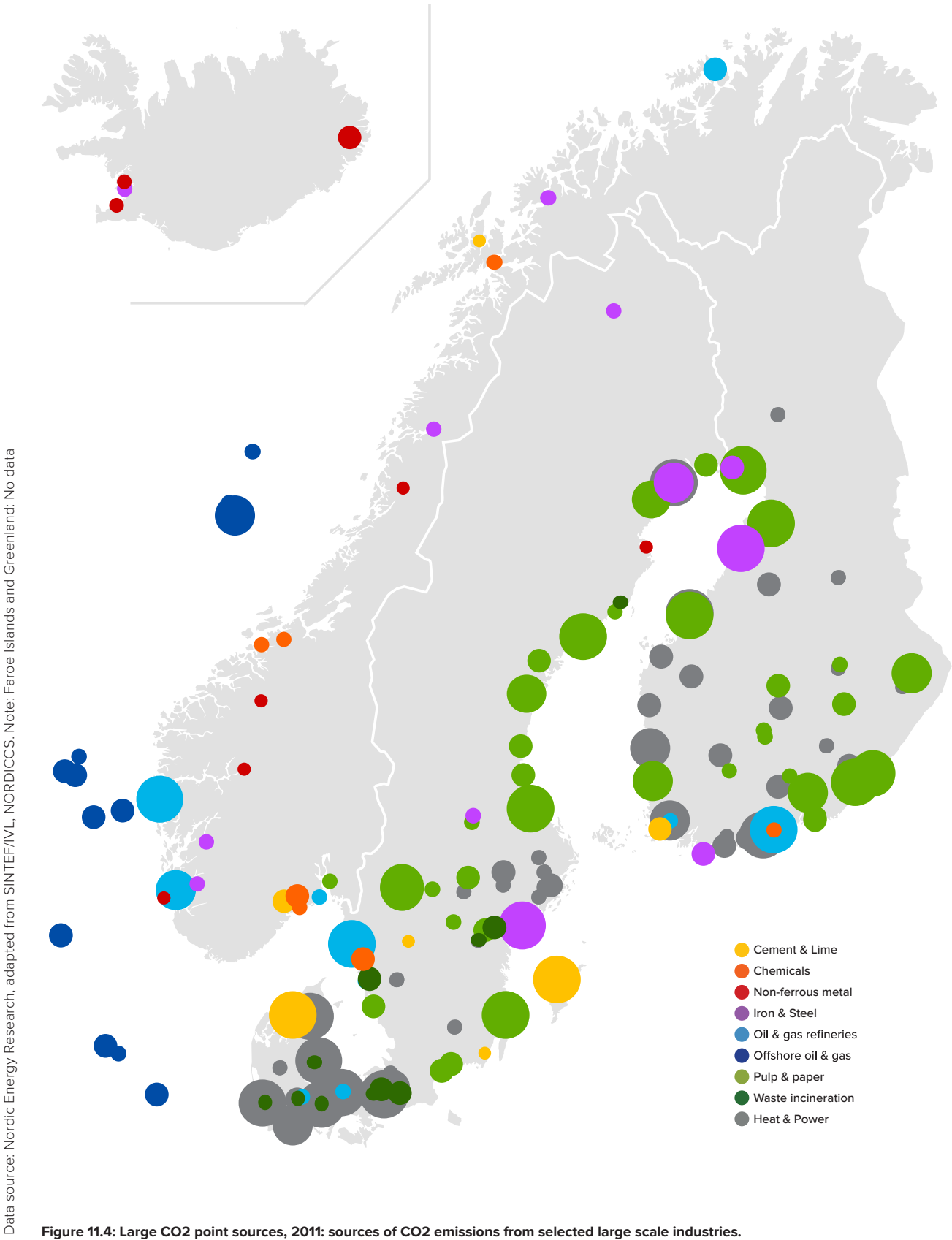
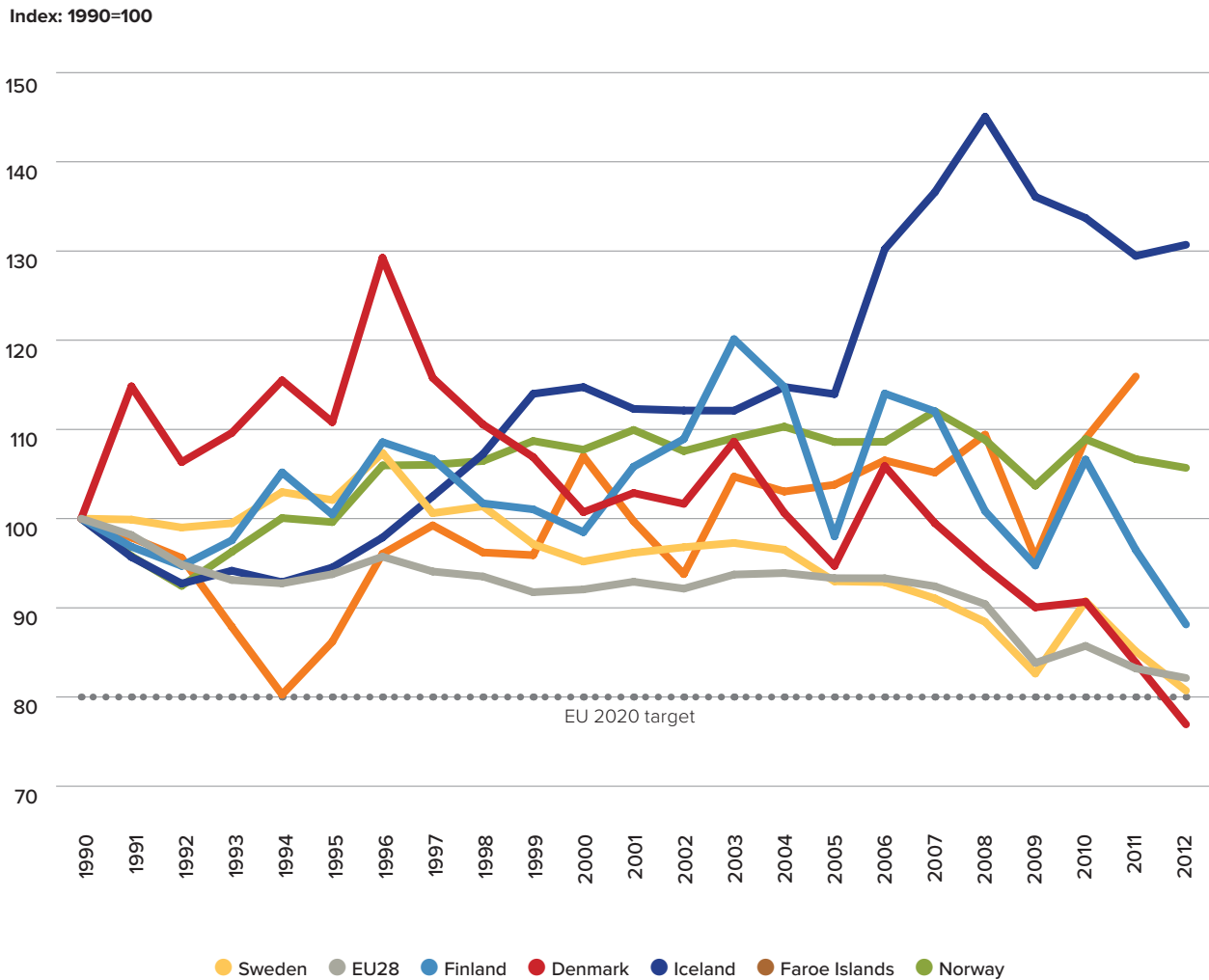


Figure 11.5: Percent change in greenhouse gas emissions since 1990



Percent change in greenhouse gas emissions since 1990: the EU 2020 target calls for a 20% reduction in European greenhouse gas emissions from 1990 levels.

trast to falling emission levels in Finland, Denmark and Sweden, Norway’s emissions have actually increased since 1990. A large share of this growth can likely be accounted for by Norway’s oil and gas industry (shown in Figure 11.4). As can be seen in Figure 11.4, other large industrial emitters include iron and steel in Sweden and Finland, non-ferrous metal such as aluminium in Iceland and Norway, chemicals in Norway, Sweden and Finland, and cement across the region. Maintaining these industries, while still meeting the ambitious 2050 climate goals laid out in Figure 11.3, will therefore require further research and development on, and eventually widespread deployment of carbon capture and storage.

The three faces of energy: consumption, production & trade

Energy has three fundamental dimensions: consumption, production and trade (i.e. transmission/distribution). Consumption describes the energy that is supplied and the purpose of its demand. Production describes the amount of energy created, regardless of where it is consumed. It can be thought of in economic terms value added, or quantity (in oil equivalence). And trade through transmission networks such as wires, pipelines, shipping or rail alleviates spatial imbalances between production and consumption.

Data source: Eurostat and Nordic Statbank. Note: Finland: Includes Åland. Faroe Islands: No data

Consumption: growing demand in key sectors

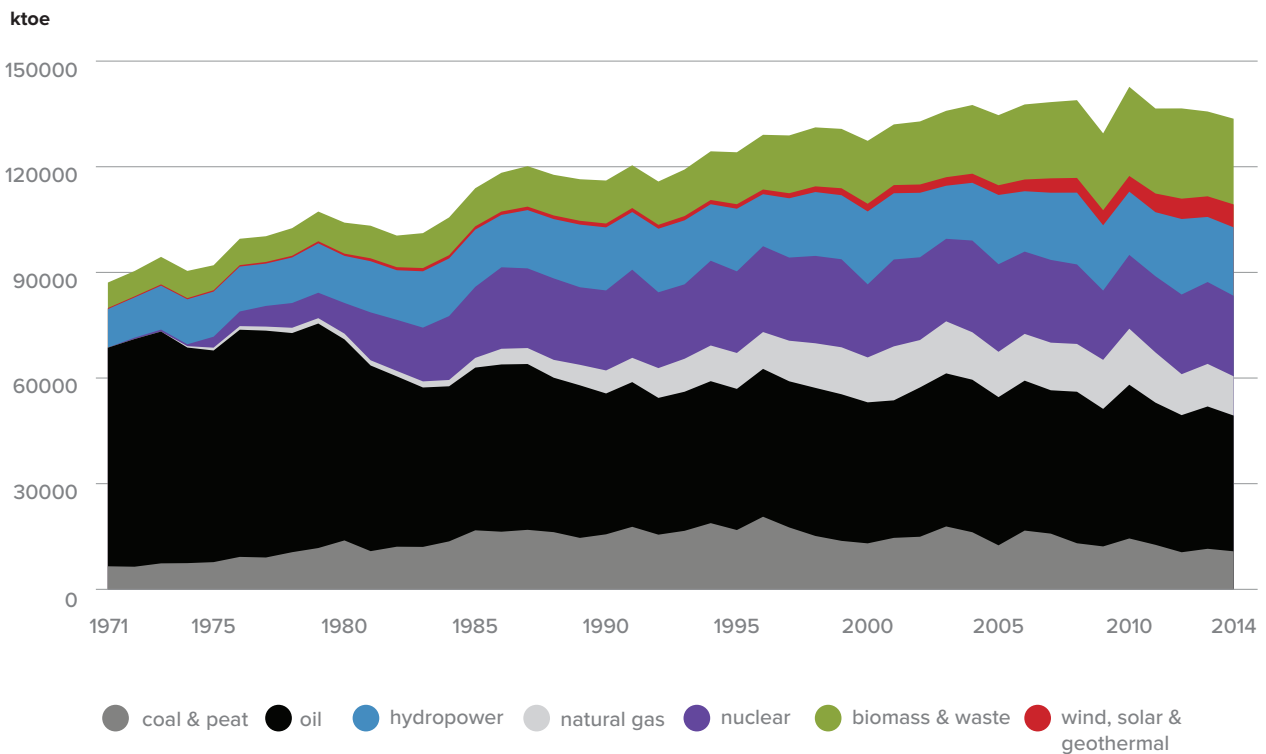
Total Primary Energy Supply (TPES) is the sum of production and imports subtracting exports and storage changes. It therefore accounts for the total energy that is demanded by a given area. Figure 11.6 outlines the trends of Nordic TPES since the oil crises of the 1970s, showing a move away from oil towards alternative energy sources. Of particular note here is the rise of nuclear energy in Sweden and Finland, as well as a rise in the use of coal in Finland and Denmark. At the same time, the past forty years have seen a steady growth in renewable energy sources like biomass and wind, as well as geothermal energy in Iceland. These are used to generate electricity, heat and transport fuels especially in Sweden, Finland and Denmark. As Figure 11.7 demonstrates, electricity produced from renewable sources is also generated from hydropower in Norway, as well as a growing amount of wind power, particularly in Denmark and Sweden. Geothermal heat and power production is the most important energy source in Iceland. With nuclear power in Sweden and Finland, over half of

the region's energy is CO2-free and, overall, 38% of the Nordic Region's total energy supply comes from renewable sources.

Despite these positive developments, oil is still the largest single energy source and the only one common to all five Nordic countries. This is due to its central role as a transport fuel. Also, despite the increases in both renewable and nuclear energy, the absolute demand for fossil fuels is roughly the same as it was 1971. This is due to an increase in the absolute demand for energy and an increase in fossil fuel use in transport and industry. In short, we see that the higher generation of low-carbon energy described above has come in addition to, not instead of, fossil fuels.

This growing demand for energy is largely explained by population growth, a higher share of single person households and by ongoing economic growth more generally. Figure 11.8 shows electricity consumption patterns across the Nordic Region, including a breakdown by main sector branches. Electricity demand for buildings generally represents a higher share of total

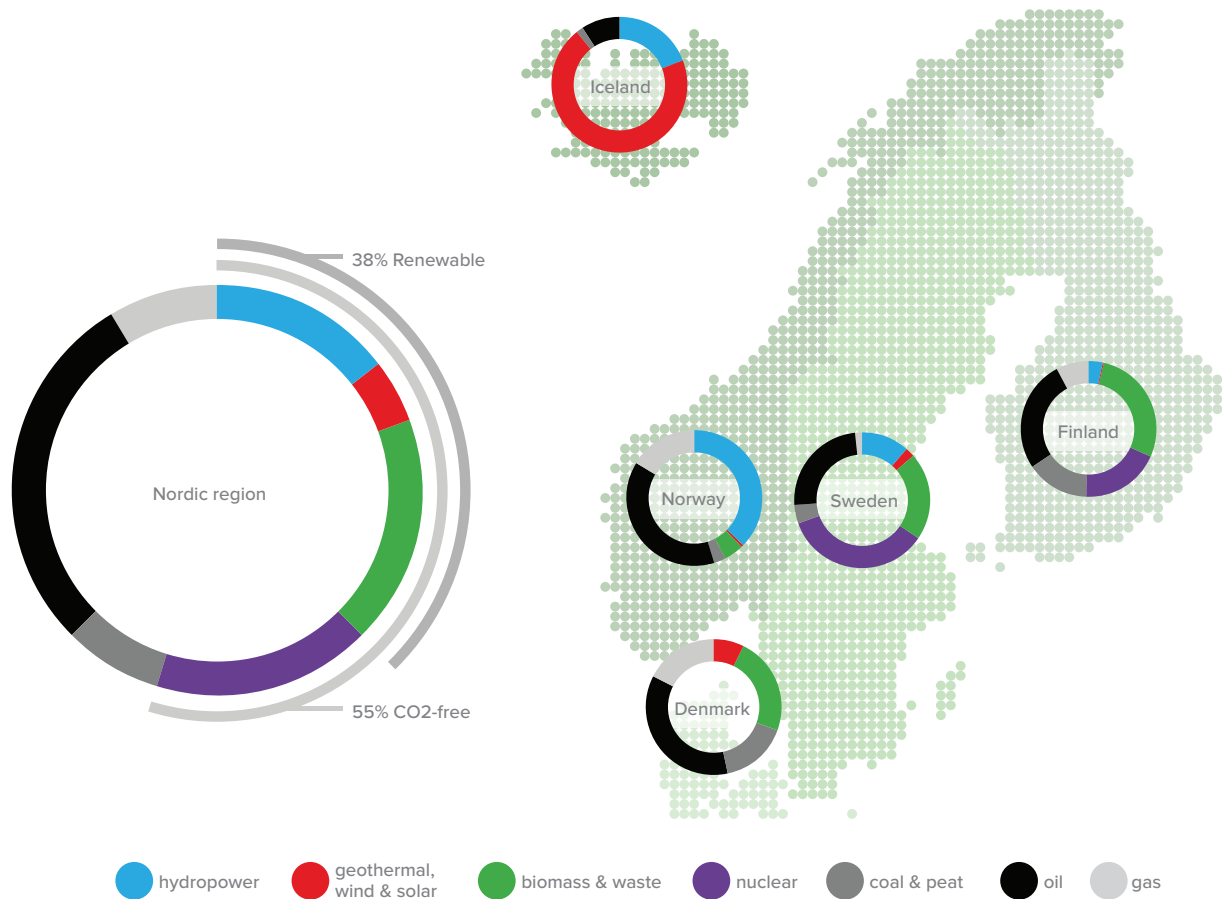
Figure 11.6: Nordic total primary energy supply, 1971-2014



Data source: Nordic Energy Research and IEA.

Nordic total primary energy supply, 1971-2014: trends in Nordic total primary energy supply by source. Reductions in the share of oil have been compensated by an increase in nuclear and biomass.

Figure 11.7: Total primary energy supply mix for selected Nordic countries in 2014



Data source: Nordic Energy Research and IEA. Note: Finland: Includes Åland. Faroe Islands and Greenland: No data

energy demand in urbanised regions, where overall energy demand is the highest but per capita energy use is lowest. Electricity and heating in buildings therefore represents a central intervention area for reducing absolute energy demand. This is illustrated in Figure 11.9, where buildings represent the largest single sector for energy consumption.

Looking ahead, overall improvements in CO2 emission levels must be met in large part by the demand sectors. Together with transport and industry, the building sector must play a central role here. Building codes and policies supporting energy efficiency measures in both new and existing buildings support a shift towards the creation of a greener building stock in the Nordic Region. Given that over 70% of today's existing building stock will be standing in 2050 however, a significant ramping up of deep renovation efforts is required in order to meet energy and climate targets (IEA/NER, 2013). Authorities at all levels need to take more action in this regard. Local gov-

ernments are mainly responsible for governing the improvement of the building stock through investment and thus need to lead by example. At the same time, national government can provide significant support through policy investments that provide direct support for energy efficiency improvements in private buildings.

Production: towards renewable energy

Our energy and climate goals can only be met through a comprehensive approach that includes the widespread development of renewable energy. The European Commission's recent Renewable Energy Progress Report (EC, 2015) highlighted that Sweden, Finland and Denmark have not only already achieved their 2020 renewable energy targets, but have surpassed them by the three widest margins in Europe.

The steady progress of Nordic renewable energy deployment is evident in Figure 11.10. Denmark and Sweden's development is particularly notable, largely due to

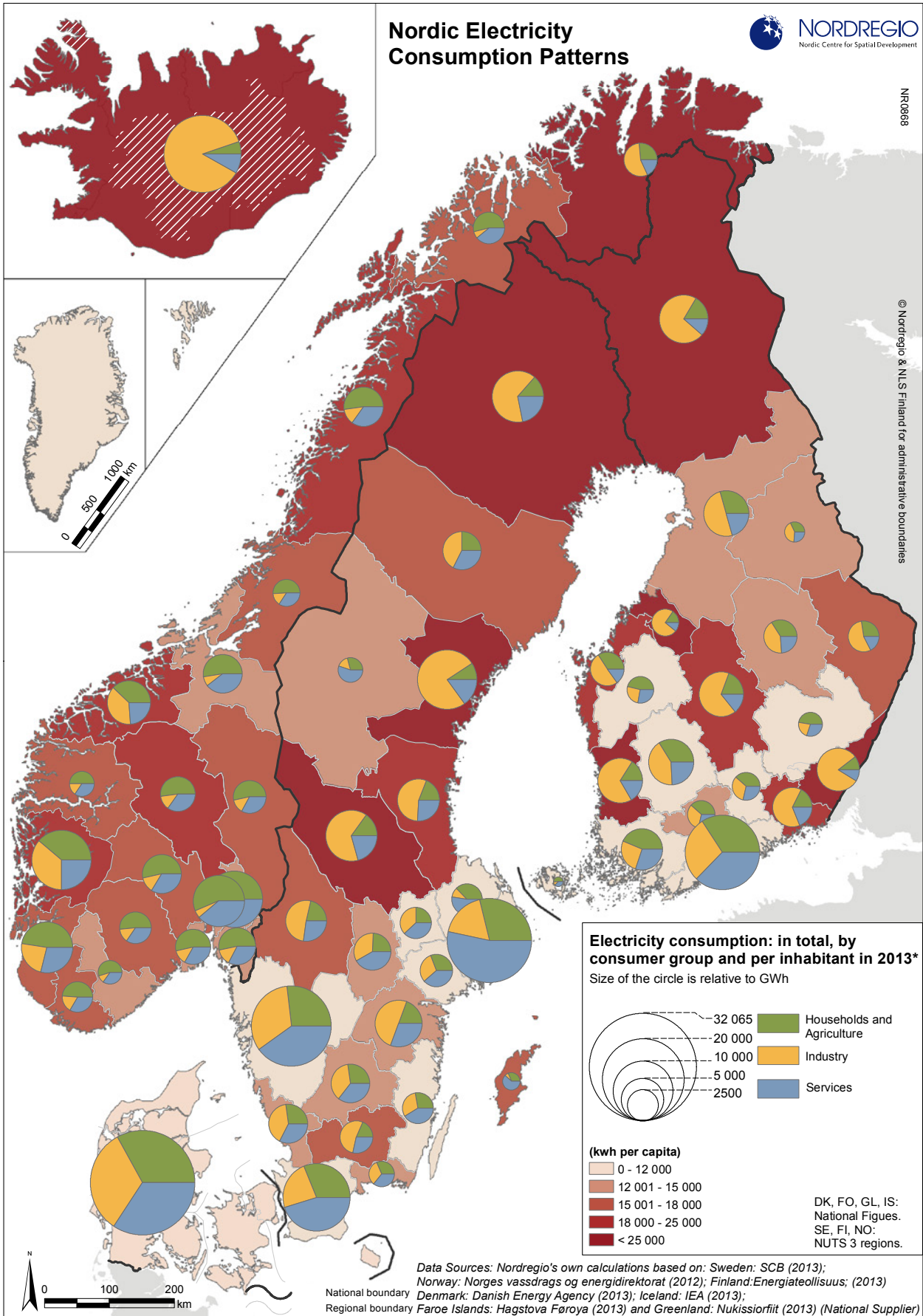


Figure 11.8: Nordic electricity consumption patterns: consumption by consumer group and per capita in 2013

their progress in the wind sector. At the same time, Figure 11.11 shows significant room for improvement with respect to renewable energy consumption in the transport sector. This is consistent with the increase in CO₂ emissions from transport in recent decades. IEA projections show significant growth in demand for transport services in the Nordic Region between 2015 and 2050 – passenger by over 30% and freight by well over 20% (IEA/NER, 2013). As a result, urgent action is required to tackle Nordic transport emissions. Considering our expansive area in a European perspective, this must include improving the efficiency of long-haul transport technologies and shifting modes away from road freight and air traffic to rail and maritime shipping. Fuel-switching to biofuels is an ideal way to reduce emissions from long-haul road freight, aviation and shipping. Unfortunately however, other higher value uses for Nordic biomass such as paper and pulp, limits their availability for biofuels. Even if half of all road freight growth to 2050 is shifted to electric trains, biofuel demand may be so high that the Nordic Region is a net importer in 2050 (IEA/NER, 2013).

With respect to passenger transportation, policies and investments that promote the use of electric cars and public transportation powered by renewable energy sources will be crucial for meeting our energy and climate targets. Cities are the key drivers of this development through effective planning and policy instruments that promote the rapid roll-out of electric cars and support modal shifts toward public transit, cycling and walking. The Nordic Energy Technologies Perspec-

tives 2013 report projected a reduction from today's 80Mt of Nordic transport CO₂ emissions to just 10Mt in 2050 in order to meet Nordic climate targets (IEA/NER, 2013). Cities can lead this reduction as their larger populations, higher population densities, and shorter commuting distances make them well suited to key technologies such as EV charging infrastructure and public transport systems. In 2050, according to the report's Nordic Carbon-Neutral Scenario, 4% of passenger transport could be avoided through better urban planning, 20% shifted from cars to public transport, and 90% of all new car sales could be EVs.

Figure 11.12 shows the spatial distribution of Nordic energy production per capita, by volume and by source type. A number of issues and patterns are evident. First and foremost, we see the high amount of electricity being produced for the five nuclear facilities in the Nordic Region. While Finland pushes ahead with new reactors, Sweden recently announced the early closure of certain reactors due to high costs and low power prices, painting an uncertain picture for the nuclear sector going forward. Second, a substantial volume of hydro-electricity is produced in southern Norway, throughout Iceland, Northern Sweden and Northern Finland. As a result, over half of Nordic electricity is produced from hydropower. With limited potential for the further development of hydropower however, wind represents a more likely area of future potential for the Nordic Region. Figure 11.12 shows some impressive results in terms of the production of wind power at the regional level. Regional wind power production has been strengthened in the past three years

Figure 11.9: Nordic energy consumption by sector in 2012

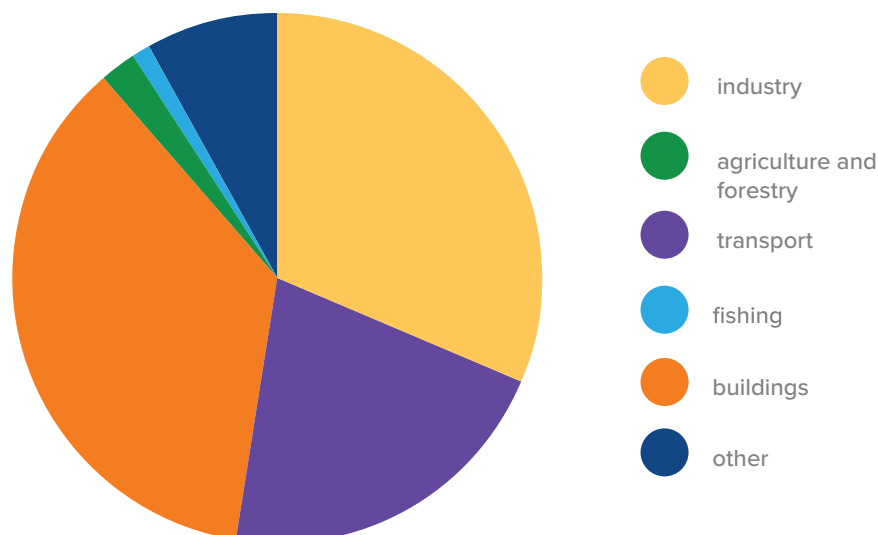
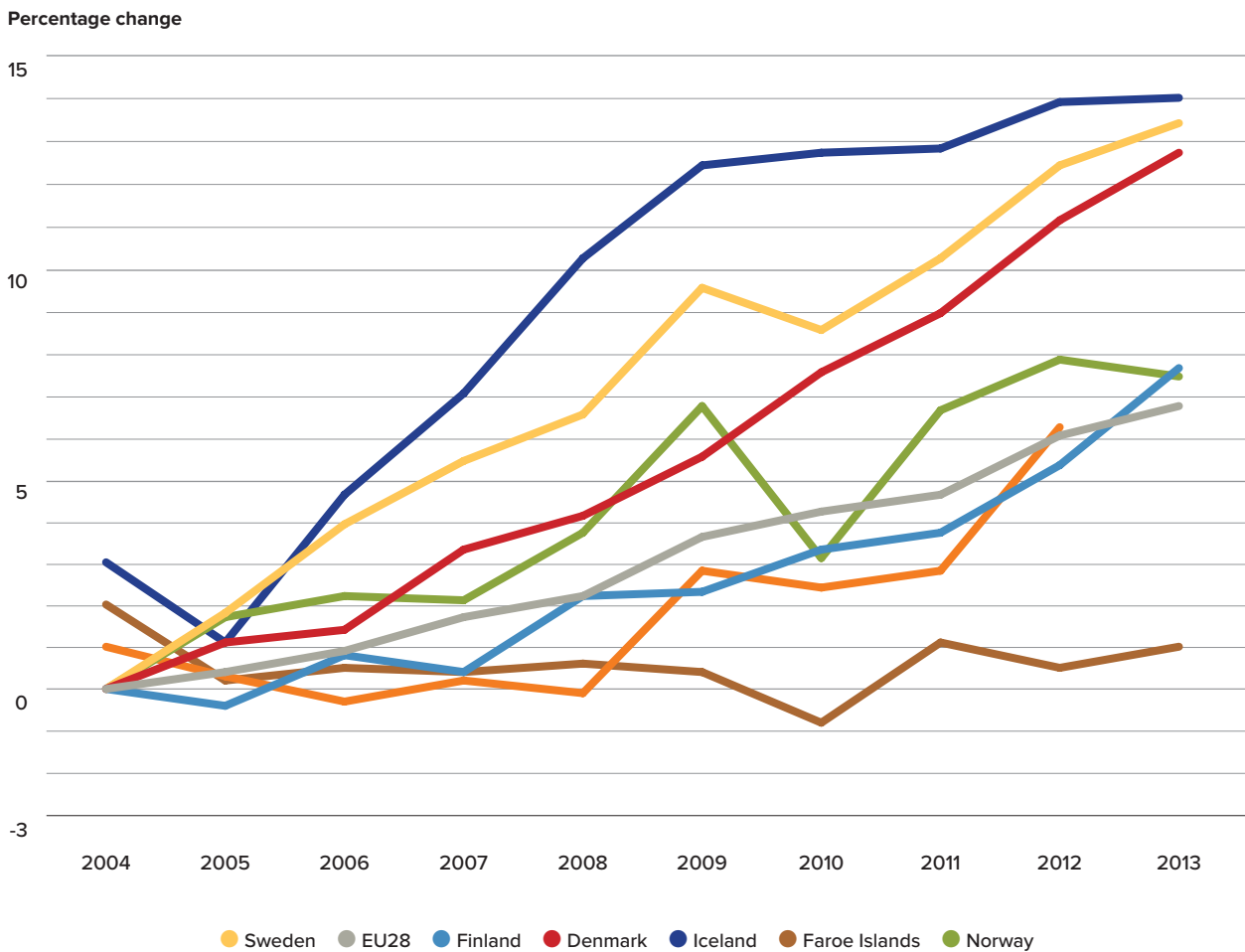


Figure 11.10: Trends in the share of renewable energy in final energy consumption, 2004-2013



Data source: Eurostat, NSI's and Jarðfeingi. Note: Finland: includes Åland. Faroe Islands: energy use for international transport not included

throughout much of Denmark, Sweden, and to a lesser extent in Norway and Finland. Low power prices have however significantly impacted the wind sector too, leading to a slowing of deployment across the region in 2015.

Despite the current lull in wind power investment, Nordic wind energy potential is undeniably significant. Nordic Energy Research has recently produced a new map that combines different data sources for each technology to indicate the areas of the Nordic Region that have the highest theoretical potential for various renewable energy sources. Figure 11.13 shows the potential for off-shore wind energy development throughout much of the coastal areas of the Nordic Region, and that the best solar resources are in Denmark and the capital regions of Sweden and Finland.

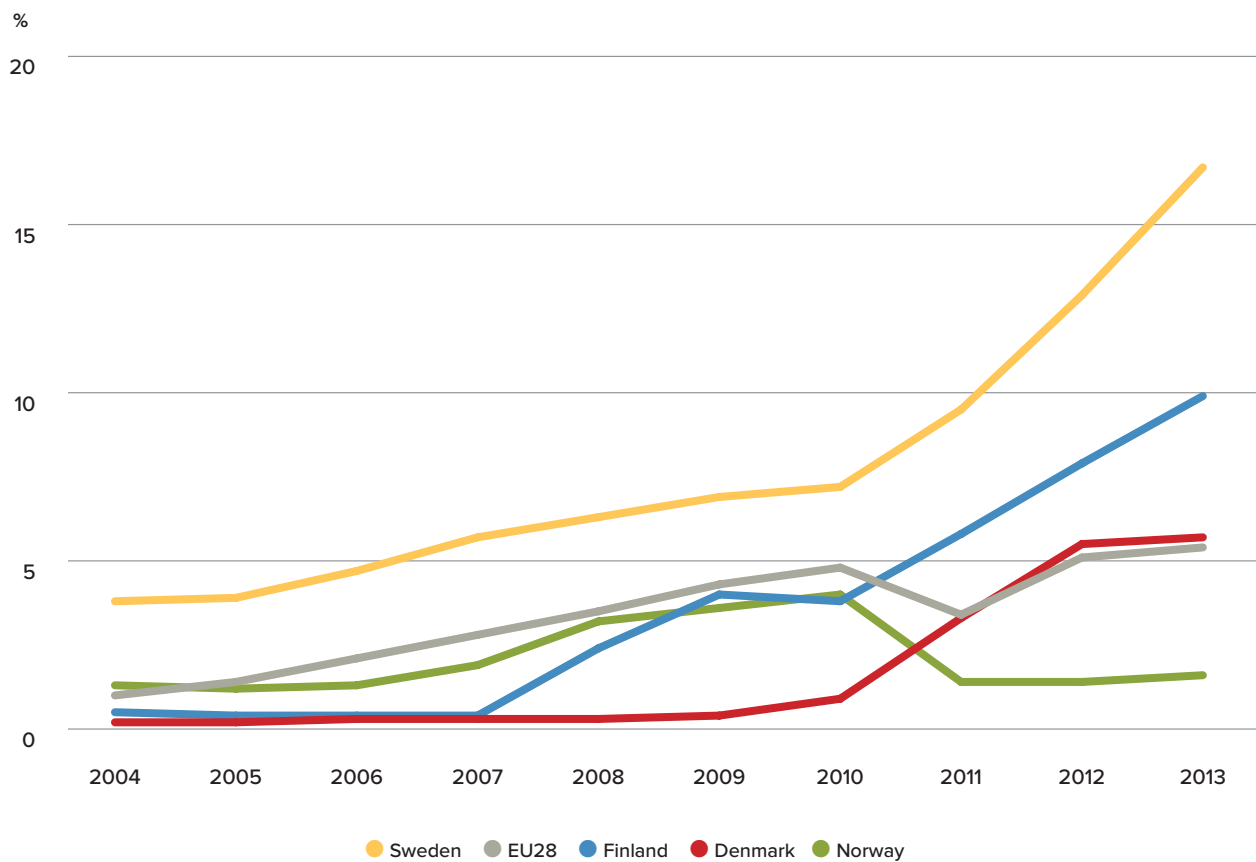
Trade: Nordic countries rely on each other

Significant electricity trade flows are evident between all Nordic countries with especially large flows between Norway, Sweden and Finland in 2014. Figure 11.14 shows

the flow of electricity between trading regions in 2014, with hydropower transmitted from the west coast of Norway to Oslo in the east, and from central Sweden south to Stockholm. The Nordic Region is also a net exporter of electricity southwards to the European continent. The figure also shows the relatively small role that Russia plays in the Nordic electricity market compared to previous years, as Finland now imports less from Russia and depends more on trading with Sweden. From 2016 a new cable between Sweden and Lithuania will begin operation, and new cables from Norway to Germany and the UK are expected to come online in 2018 and 2020 respectively. If interconnection infrastructure is built out further, Nordic exports of clean electricity to the continent could increase significantly towards 2050.

In the Nordic Region we have wide differences, with some regions or countries being heavy net importers of energy to meet their demand (Denmark for instance), while others export a large share of their produced energy on international markets (e.g. Norway). Iceland,

Figure 11.11: RES development in transport in selected Nordic Countries



Data source: Eurostat. Note: Finland: Includes Åland, Faroe Islands, Greenland and Iceland; No data. Data missing and assumed for Finland in 2011 and 2012

with its energy-intensive refining of foreign raw materials into immediately exported goods can also be seen as a heavy exporter of energy, even though it may not appear this way in the statistics.

The Nordic Region has the world's most integrated international electricity market, enabling the optimisation of each country's diverse resources. Nordic electricity grid integration also provides security of supply against uncertainties. These uncertainties include annual variation in precipitation affecting hydropower reservoirs, unusually cold winters leading to increased heating demand, maintenance of nuclear power plants and changes in access to electricity markets outside the Nordic Region. This was exemplified in 2014 when Finland – already experiencing a delay in the construction of its newest nuclear power plant – was unable to continue the large net import of electricity from Russia that it had relied on in previous years. Finland therefore imported over 60% more electricity from Sweden in 2014 than in 2013, making that connection the largest cross-border flow of electricity in the region.

Market integration through a well-developed network also allows for the region to benefit from its significant

variable renewable energy sources, where production is dictated by short-term changes in the weather. Figure 11.15 shows the share of gross electricity production coming from wind, solar and ocean power for selected countries. Denmark's high share of wind is evident, covering upwards of one third of its electricity production. Germany's deployment of wind and solar options gives it a total of around 15% for variable renewables, while Sweden and the UK have seen recent surges in wind power.

The higher the share of variable renewables, the greater the need for flexibility in the electricity system. Denmark is connected to Norway and Sweden by sub-sea interconnector. Under windy conditions, Denmark exports to Norway and Sweden. Under calm conditions, Denmark imports hydropower from these countries. Without this flexibility, the cost of wind power integration in Denmark would have been higher and the system less efficient.

The Nordic Region can further capitalise on its potential to supply clean electricity to Europe by making the common Nordic grid even stronger and more flexible. For example, the significant wind build-out expected in the Nordic Region will require additional infrastructure

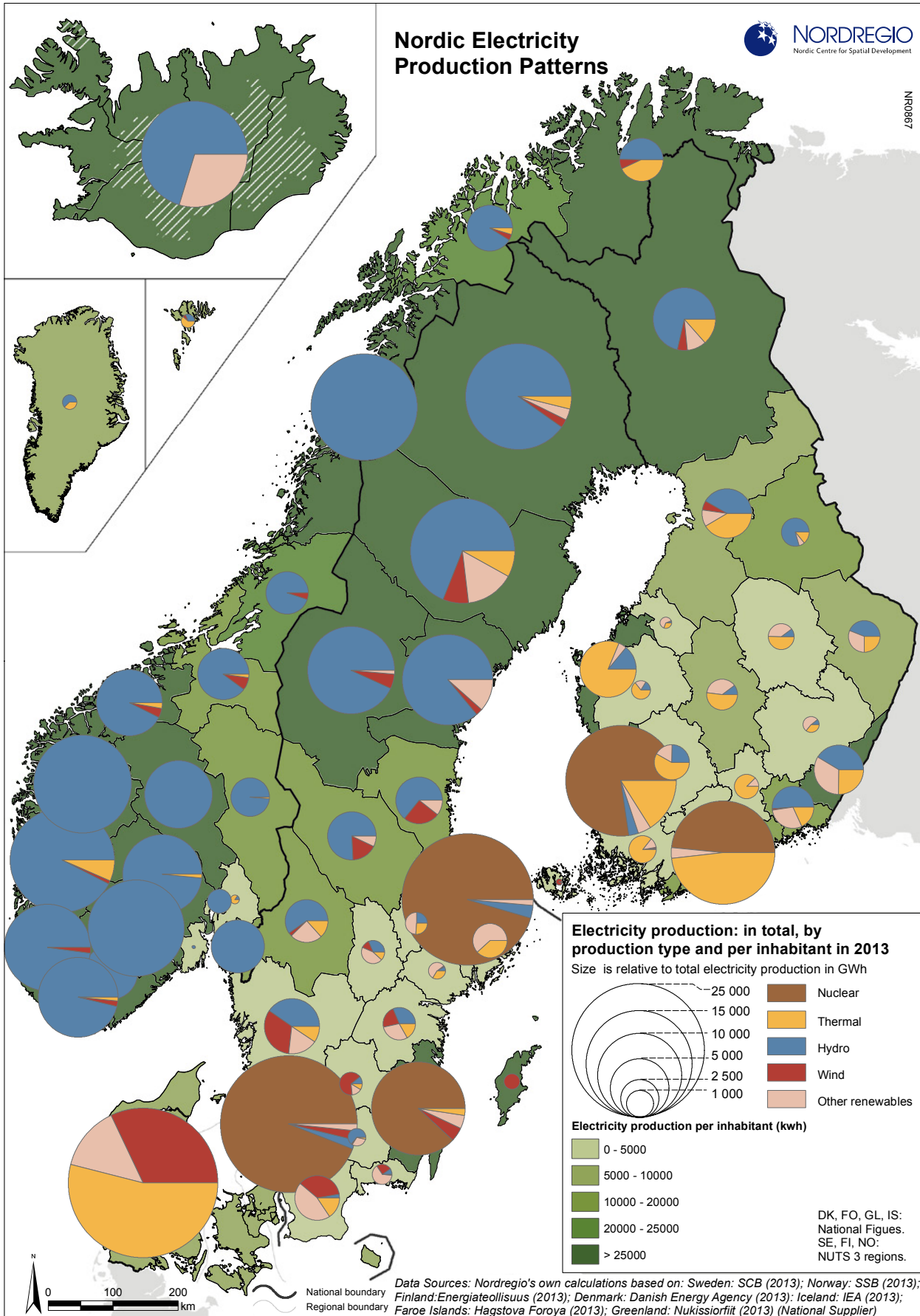


Figure 11.12: Nordic electricity production pattern: by volume (per capita) and by source groups in 2013

Figure 11.13: Nordic Renewable energy potential

SOLAR

The yellow coloured triangles on the renewable energy map indicate areas with a relatively high solar irradiation for the Nordic region – specifically a yearly sum of global irradiation above 1150 kWh/m², measured at an optimal fixed inclination.

► EC. 2012. PVGIS. RE.JRC.EC.EUROPA.EU/PVGIS

GEOHERMAL

The red coloured triangles on the renewable energy map indicate areas with high geothermal potential. This is defined as a heat flow density above 80 mW/m²

► EC. 2002. ATLAS OF GEOHERMAL RESOURCES IN EUROPE. GOO.GL/BTKDC6 GOO.GL/96GVVO

BIOMASS

Green indicates areas with land cover suitable for production of biomass. This includes areas of forest, cultivated crops, and urban areas, which are defined as municipalities with a population density of over 100/km²

► NORDREGIO. 2008. GOO.GL/NBBFTK (ICELANDIC LAND COVER: GOO.GL/FV9VXT)
 ► NORDREGIO. 2011. GOO.GL/OBSCFO

WIND

The blue colour indicates areas with an average wind speed above 6 m/s at hub height. This is averaged over the period 2000-2005, at 80 m above ground level for onshore and 120 m for offshore, and corrected for orography and local roughness. Data for offshore areas is incomplete. A separate dataset was used for Iceland, with measurements at 100 m above ground level.

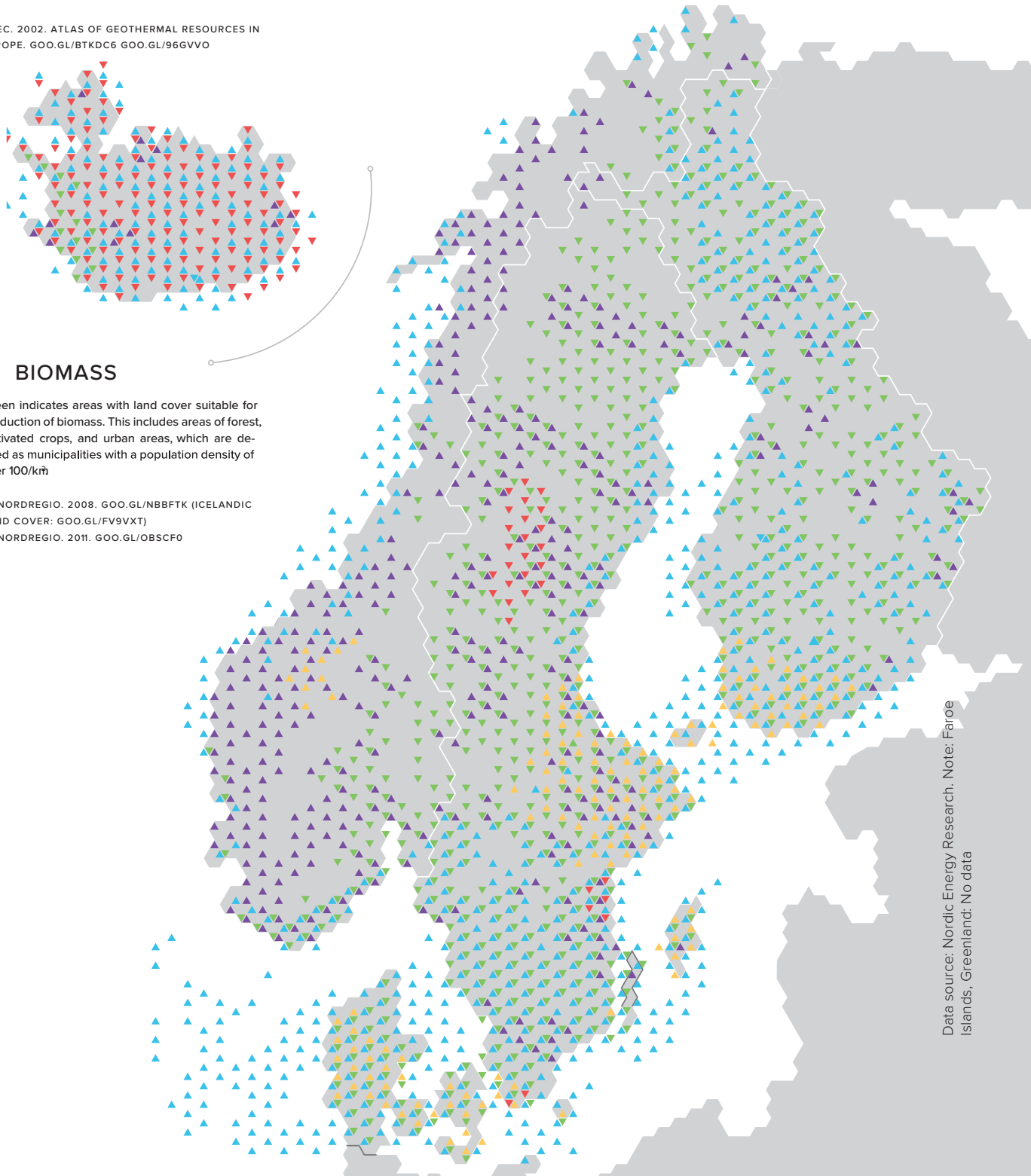
► EEA. 2009. EUROPE'S ONSHORE AND OFFSHORE WIND ENERGY POTENTIAL. P.14. GOO.GL/JC9HFR
 ► IMO. 2013. THE WIND ENERGY POTENTIAL OF ICELAND. P.27. GOO.GL/XTNYBK

HYDROPOWER

Politically, the greatest potential for increased hydropower generation in the Nordic region is through the upgrading of existing infrastructure.

The purple coloured triangles on the above map are indicating areas with existing hydropower installations in 2005 over 0,1 MW.

► LEHNER ET AL. 2005. THE IMPACT OF GLOBAL CHANGE ON THE HYDROPOWER POTENTIAL OF EUROPE. ENERGY POLICY. P.839-855. GOO.GL/UE2B5L



Data source: Nordic Energy Research. Note: Faroe Islands, Greenland: No data

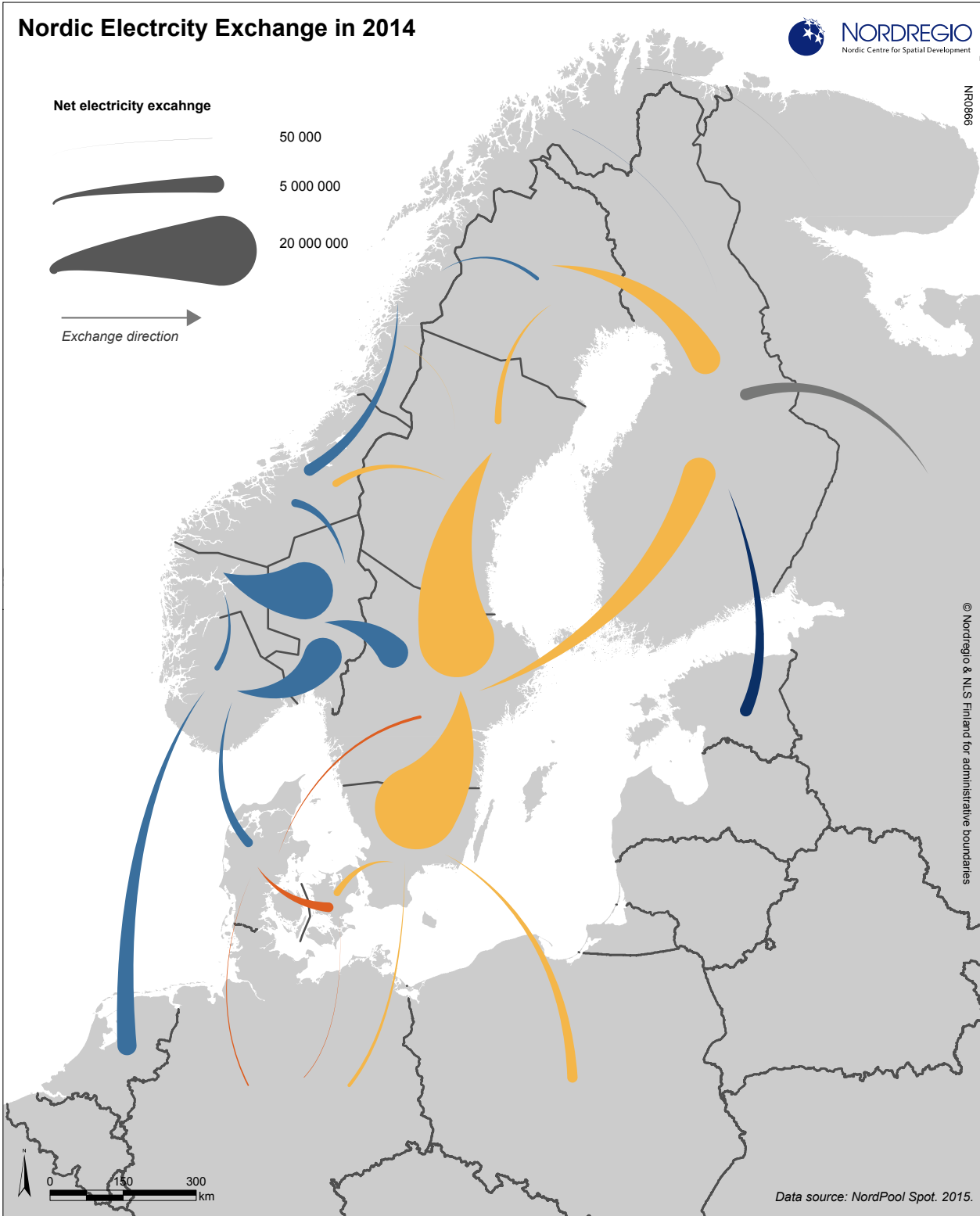
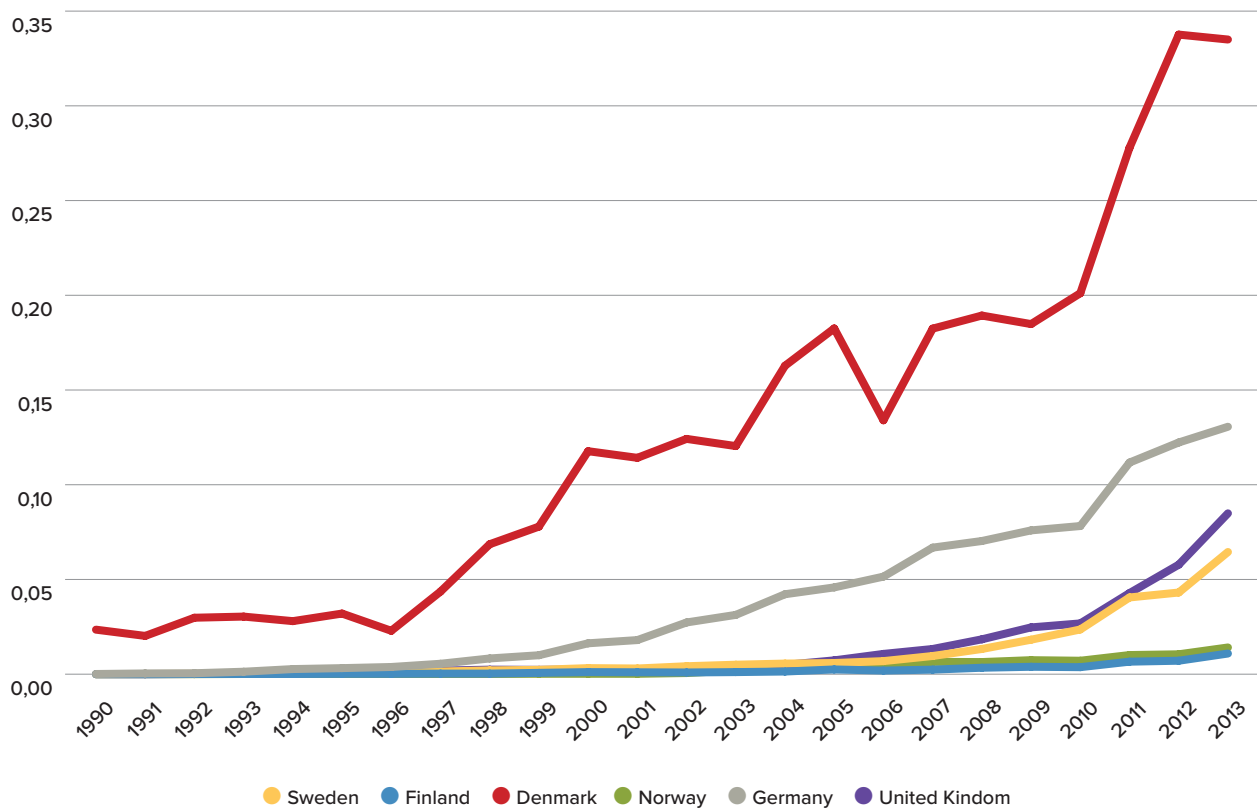


Figure 11.14: Nordic electricity exchange in 2014: net annual electricity trade flows between price zones in the Nordic Region and adjacent countries for 2014. The Nordic countries were net exporters in 2014, but much greater flows are evident within the Nordic countries, moving hydroelectric power from mountainous regions to major cities Note: Faroe Islands and Greenland: No data

Figure 11.15: **Share of variable renewables in gross electricity production**



Share of variable renewables in gross electricity production: electricity production from variable renewables (wind, PV solar, ocean) as a share of gross production. Denmark's large share of wind power and Germany's wind and PV solar have necessitated measures in those countries to balance the weather-dependent production output from these technologies.

in order to be integrated efficiently. This can be facilitated through internal grid strengthening within and between the Nordic countries, through expansions in interconnector capacity to Europe, and through other interrelated flexibility measures. The forthcoming second edition of Nordic Energy Technology Perspectives will offer a special focus on the flexibility measures available to better integrate large amounts of new Nordic wind generation. In addition to grid integration with Europe, these include storage (such as pumped hydropower or battery electric vehicles), flexible supply (such as capacity mechanisms or dispatchable hydropower) and flexible demand (such as demand response, power-to-heat, or power-to-fuels).

Funding strong for clean energy solutions

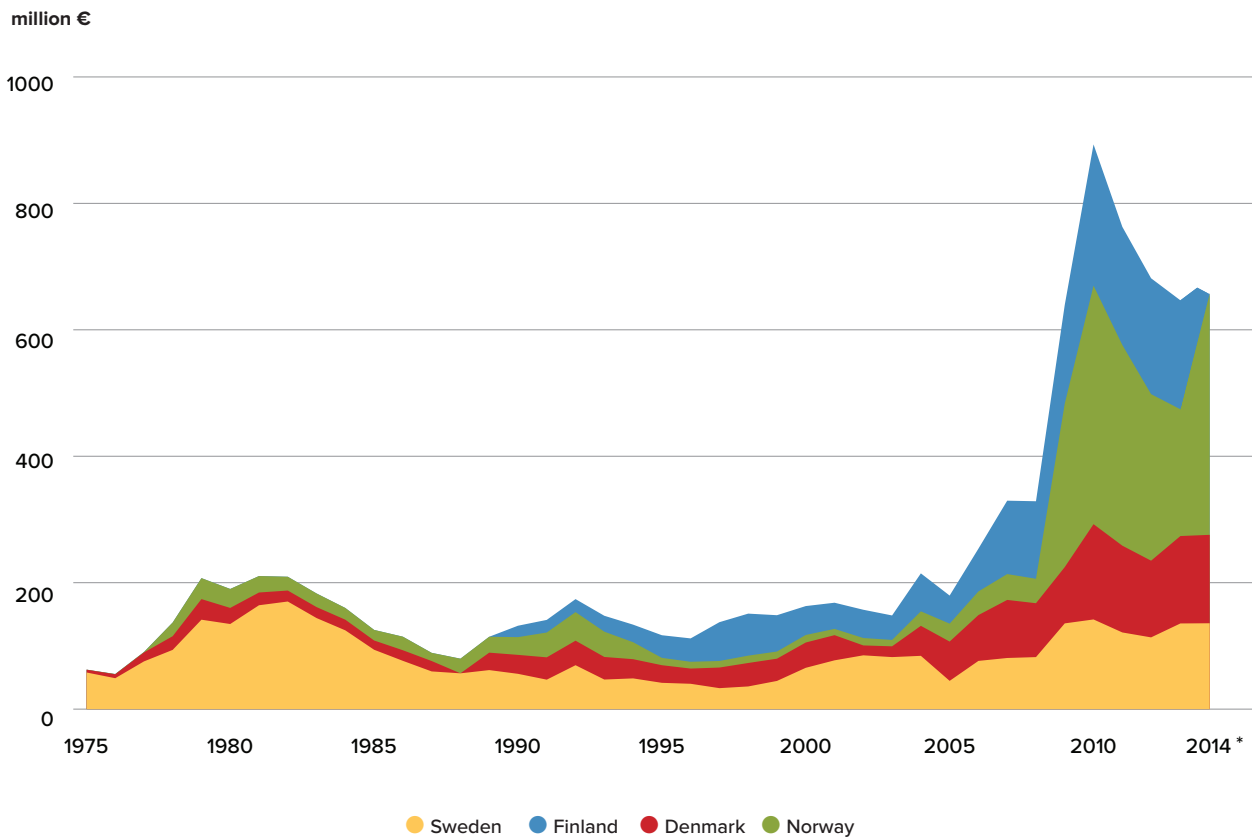
Public funding for non-nuclear low-carbon Research, Development and Demonstration (RD&D) in the Nordic countries has increased dramatically in the last decade. While

these statistics are affected by allocation issues and do not account for private investment in RD&D, they paint a clear picture of the focus of Nordic governments on accelerating clean energy technology development. After decades of support at levels below its neighbours, Norway has emerged as the largest funder of low-carbon RD&D in recent years due in the main to two very large demonstration projects in CCS and aluminium smelting. The technology areas currently receiving the most support across the Nordic Region are energy efficiency and bioenergy.

Nordic cooperation is key to future energy development

The Nordic Region has emerged as a leader in many aspects of the global transition to cleaner energy systems. While 2014 may have seen the first global decoupling of GDP from energy-related CO₂ emissions (IEA, 2015), the Nordic Region has exhibited a steady decoupling for almost 20 years.

Figure 11.16: Public research and development investment budgets in low carbon energy sources



Public research and development investment budgets in low carbon energy sources. Norway's significant increases in the last decade stem mainly from support of CCS technologies.

©Nordic Energy Research. Data source: IEA. Note: Finland. Includes Åland. Faroe Islands, Greenland and Iceland: No data

A strong Nordic electricity market and grid integration enhances efficiency and security of supply. This has allowed, for example, Denmark to integrate the world's highest share of variable renewables into its electricity system in an efficient manner.

Ambitious, long-term and stable policy frameworks have been the key to achieving this leading position. All five Nordic countries have used policy frameworks actively to decouple GDP from CO₂, with carbon taxes and renewable energy incentives among the most effective examples.

However, there are a number of opportunities to further decarbonise the Nordic energy system. The Nordic Region can capitalise on its potential to supply clean electricity and balancing services to Europe by making the common Nordic grid stronger and more flexible. The significant wind build-out expected in the Nordic Region will require additional infrastructure in order to be integrated efficiently.

CO₂ emissions from transport must be decoupled from rising demand for transport services if climate

targets are to be met. Nordic cooperation in transport infrastructure and policy can accelerate this decoupling. Urban transportation can lead the uptake of electric vehicles and modal shifts to public transport, while a large-scale transition to sustainable biofuels can decarbonise long-distance road, sea and air transport.

Nordic cities are more energy efficient than rural areas and can deploy a wider range of technology options. District heating, electric vehicles and public transport systems are more efficient and economical in densely populated areas. Knowledge sharing between Nordic cities can identify best practices in urban energy systems.

Lastly, Nordic cooperation can reduce the cost of achieving national climate targets. According to the IEA (IEA/NER, 2013), the potential for cooperation is high in RD&D, infrastructure and policy development. Technologies with high cooperation potential include offshore wind, biofuels, CCS and the electricity grid.

Chapter 12

HOUSING:

Demand exceeds supply in Nordic markets

Author: **Moa Tunström**

Maps and data: **Gustaf Norlén, Anna von Zweybergk, Julien Grunfelder and Linus Rispling**

How we choose to build our cities and regions forms the basis for our everyday lives. The built environment is also an important factor in future social, ecological, economic and spatial development. The character of this future development is however dependent upon the types of housing that are available, what is being built and at what price. Can migrants from other cities, regions or countries afford to move into the area assuming there are homes available to buy or rent? Is affordable student housing available? Answers to questions such as these, and the comparative Nordic approach can, for example, function as indications of social sustainability and integration, i.e. where can people with different resources actually settle and stay in the Nordic countries? Nordic cities are segregated and housing and construction are key factors in this development, influencing the spatial relations between different socio-economic groups.

Nordic property prices rising rapidly

Housing data is of relevance to several actors; developers, buyers and sellers on the housing market, tenants, the homeless, policymakers, and local as well as regional planners. The first indicator in respect of the current situation regarding housing in the Nordic countries presented here is the House Price Index, an index referring to the cost of housing on the property market, i.e. housing as a good up for sale. This illustrates the relationship between supply and demand. It is also an aspect that is highly dependent on financial market fluctuations, illustrating the financial risks residents in the Nordic countries are willing to take when it comes to housing.

Figure 12.1 shows the changes in the prices of residen-

The built environment is an important factor in future social, ecological, economic and spatial development.

tial property purchased by households (HPI) between the first quarter of 2005 and the first quarter of 2015, i.e. during a ten year period. The index, where 100=first quarter of 2005, is based on Eurostat's final market price data for all types of residential properties (apartments, detached houses, terraced houses etc.). In all of the Nordic countries HPIs have increased more than the EU average. As an example housing prices in Norway have increased by 400 percent in the period 1992-2014. During the same period prices overall have increased by only 55 percent (Statistics Norway 2015, p.19).

Prices fell as a result of the financial crisis in 2008 – this was true for all countries although the decrease was most visible in Denmark and Iceland. Sweden has however subsequently seen a rapid increase in house price levels. According to Eurostat, in European terms only Estonia has witnessed a more rapid increase.

Increasing property prices imply that property is a scarce and attractive resource. The effects of a steady price increase over a period of time can however vary. For example, high prices and competition in a national

context where housing ownership is a positive norm and rental housing is negatively stigmatised can emphasise socio-economic differences. Whether there are measures in place to provide loans at attractive rates is also an important factor in terms of the socio-economic effects of rising housing prices.

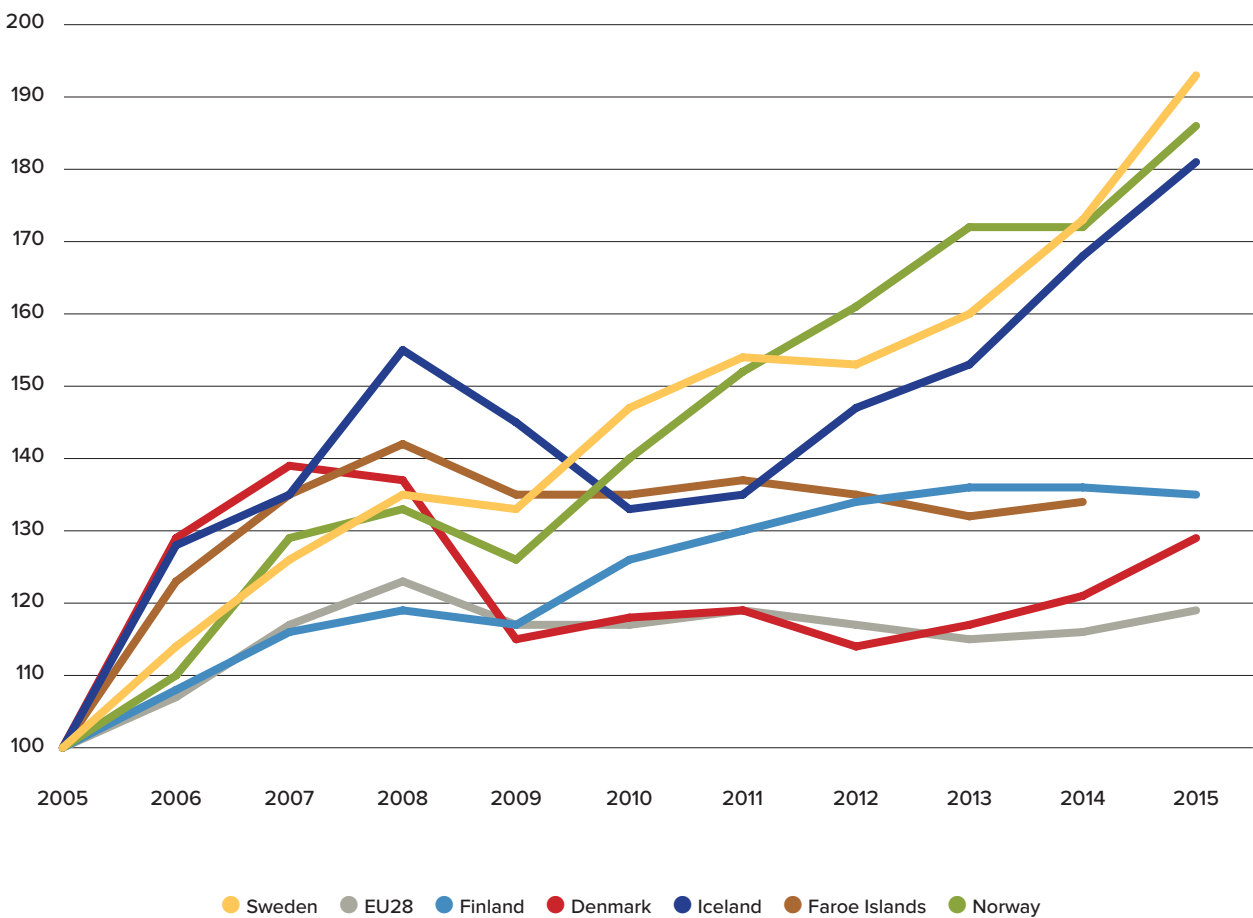
Building sector recovery fails to meet housing need

House prices are of course related to what is available, what is being built and how this relates to existing demand. However, the housing construction sector is also strongly dependent on state support measures and international market trends. In the Nordic countries there are different views on what the role of the state should

be in housing production. In Norway and Finland state institutions exist for the financing of housing construction and to support households to get onto the property ladder particularly in respect of different forms of owner-occupied housing, while in Denmark and Sweden stronger public housing companies exist instead (Boverket 2011).

The effects of international dependencies are visible in the two charts below (figures 12.2 and 13.3). Since the year 2000 the development of residential construction has followed a broadly similar pattern in Sweden, Norway, Denmark and Iceland. The socio-economic effects of the development of housing construction are however difficult to interpret from these charts since the data does not take tenure form into account. Whether the completed dwellings in the chart below (figure 12.2)

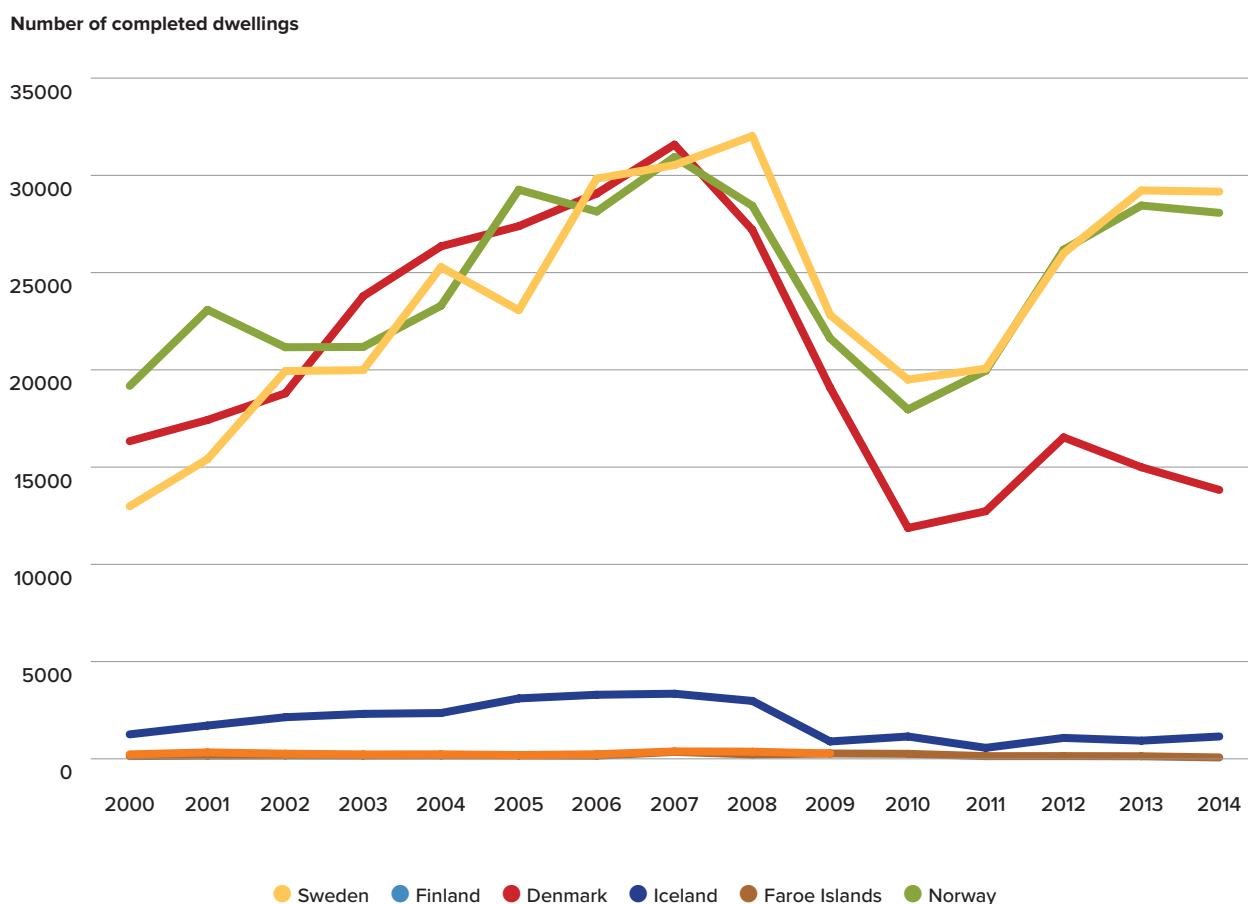
Figure 12.1: National house price index (HPI), 2005-2015



Data source: Eurostat. Finland: Includes Åland. Greenland: No data

Refers to the first quarter of each year. NB: HPI refers to final market price of residential property purchased by households

Figure 12.2: Development of residential construction 2000-2014: number of completed dwellings



are rental or owner-occupied has a significant impact in terms of their socio-economic effects on the ground. Who can afford the homes, who can access them and how, where in the urban landscape are they located etc.?

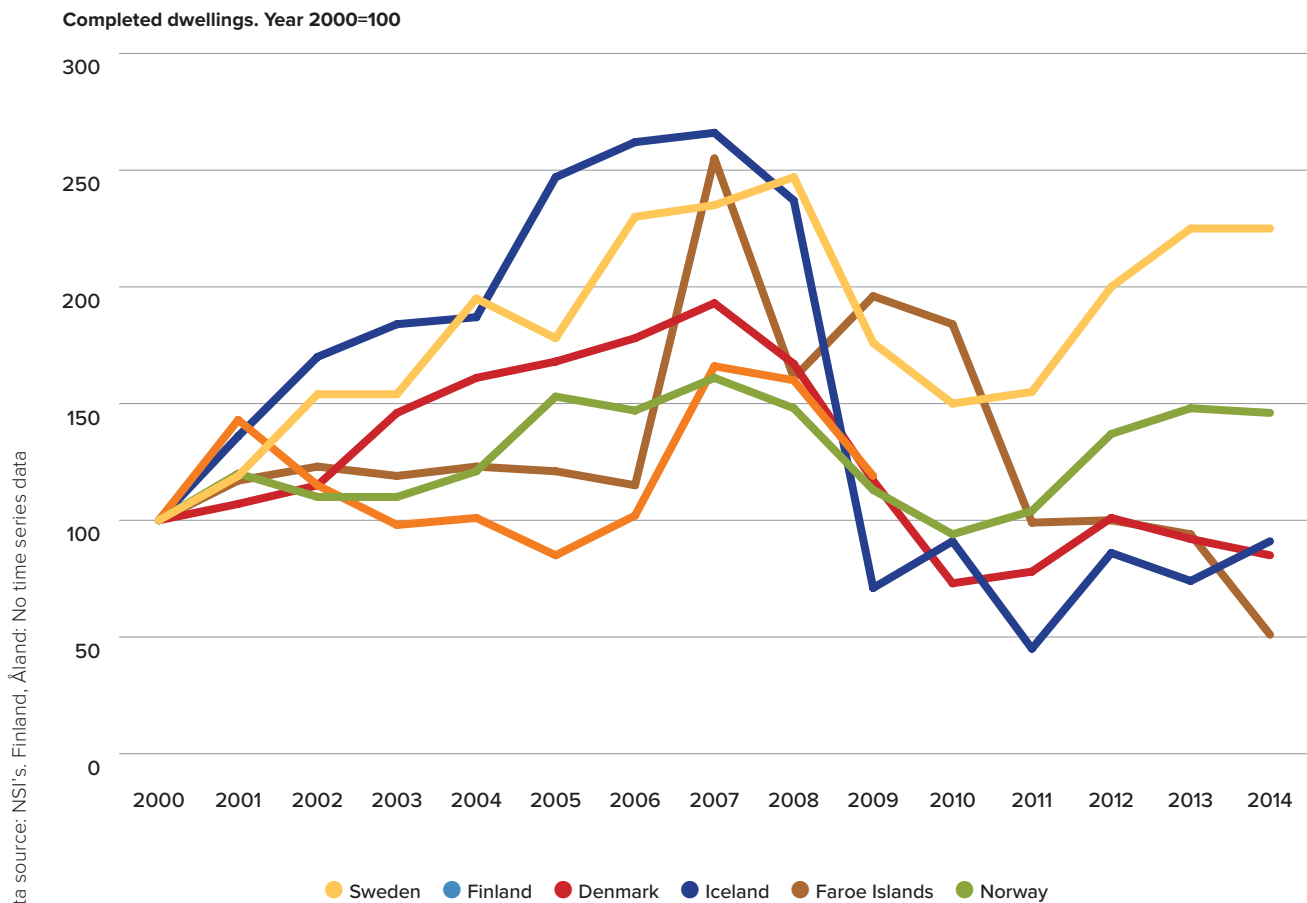
House building declined significantly after the financial crisis. In Sweden and Norway the number of completed dwellings has however subsequently increased, but the big cities are still experiencing a housing shortage. This is particularly so in Sweden, where housing construction also fell in the early 1990s, and since then has remained on a comparatively low level. As a consequence of these historic downturns in house building, in 2012, almost half of Sweden's municipalities suffered from a lack of housing and thus young people in the larger urban regions in particular where finding it increasingly hard to find suitable accommodation (Statistics Sweden 2012, p.8-9). As can be seen in the charts below, Denmark has faced even greater problems in recovering than Sweden or Norway. It should moreover

be emphasised that Sweden's increase is still relatively minor, both from a long term perspective and in relation to the general lack of housing.

The data for Finland was only available for the combined period 2010-2014 and has not therefore been included in the charts. In the map (figure 12.4) Finland is presented with the average from the period of 2010-2014. Looking, however, at the available data from a long term perspective (since 2001) on the national level for the volume of approved building permits, Finland's situation remains broadly similar to that of Sweden and Norway. Finland saw a rise in approved building permits up to 2008 and has thereafter witnessed a reduction in the rate of approved permits in relation to historic levels (Statistics Finland 2015).

Figure 12.2 shows absolute numbers for completed dwellings. These numbers must however be interpreted in relation to population size, while Figure 12.3 is indexed with 2000 as the index year. It is striking that ba-

Figure 12.3: Development of residential construction, index 2000-2014: number of completed dwellings



sically all of the Nordic countries are either stagnant or in real decline in 2013-2014, except Iceland which saw a minor increase. Iceland's property market was booming up to the financial crisis in 2008, but, the decline was severe after the onset of the crisis, and the small increase between 2013 and 2014 must be viewed in relation to the fact that new construction had reached rock-bottom in 2011 with the lowest index value for all of the Nordic countries during the 2000's.

Housing construction data on the national level is actually more of an indicator for the construction and business sector than for the actual spatial development of a country. Indeed, as noted previously, tenure forms are important in terms of the spatial development consequences new residential construction has, but also the location of new housing. In the map (figure 12.4) below housing construction is mapped on the municipal level providing some more information of the effects on the ground – in cities and regions. If it would be possi-

Comparing statistics on residential dwellings construction

There are no EU regulations in respect of the statistics on the construction of residential dwellings. The definitions do however seem to be fairly comparable between the Nordic countries and comparisons have been made in other studies, e.g. by Boverket (2011). The selected data in figures 12.2-12.5 show the number of new completed dwellings (on the municipal level). It should thus only include residential buildings (and not other kinds of new construction) and the unit is the "number of dwellings". All kinds of residential dwellings are included.

The challenge of housing data

Challenges exist both in terms of finding comparable data and in choosing the best explanatory level when it comes to using the data found in relation to housing and construction in a Nordic perspective. This is of course related to differences in policies between countries, as well as to specific historical contexts. For example, what are the available tenure forms in the different countries and cities? Is there an extensive endowment of 'social' housing? Who are the most prominent builders and landlords – public or private actors? All of these factors influence how housing develops in a country or city, and differences such as these can make statistical comparisons difficult. A good starting point in the search for information here is Eurostat, since their data is comparable between countries. They do not however have much data on housing, and the data that they do have is on the national level. National data can describe national policies, but when it comes to housing and construction in the Nordic perspective, municipal or even district level data is much more useful. If housing statistics are to be used as an indicator of spatial development, in an attempt to understand the spatial consequences of market trends, segregation or urban-rural relations, this would only be possible with access to comparable data on the municipal or district levels for all of the Nordic countries.

A second important remark to make in relation to the presented data is that the theme of this chapter, housing, is a general variable that can cover many aspects of housing. As such, this chapter is focused on property prices, residential construction, tenure forms and overcrowding.

ble to zoom in on this map and see the differences between urban and suburban areas in single municipalities illustrating the importance of land value, it would be even more instructive. Nevertheless, this map still has two striking characteristics. Firstly, the low level of construction in Swedish municipalities outside of the urban regions or larger cities is apparent. Overall, new construction especially in Norway and Finland is

It is striking that construction in basically all of the Nordic countries was either stagnant or in real decline in 2013-2014, except Iceland which saw a minor increase.

in general higher and more spread out geographically. Secondly, construction is relatively lower in Denmark, and the Copenhagen region stands out in comparison to the other Nordic capital regions. This is also in line with figure 12.2 and figure 12.3, which show a substantially lower new construction pace in Denmark in recent years when compared to Norway and Sweden. It is also notable that large parts of the rather rural island of Åland have recently seen a high share of newly completed dwellings. The municipality of Jomala near Mariehamn stands out in particular, indicating that the capital region on this small island is currently growing. The data on the map in figure 12.4 can be interpreted overall as an indication of urbanisation and the enlargement of cities, since many of the municipalities with the largest construction per capita are those on the edges of urban regions or just next to larger cities.

Home ownership dominant across the Nordics

This chapter has concentrated on the housing market for buyers, owners and developers. This section will however move the focus onto rental tenure. Across the Nordic countries several forms of tenure currently exist. As a resident you can rent or own your dwelling, individually or co-operatively, and in some cases there are also mixed tenure options. Housing policies regulate the role of public and/or social housing in relation to the dwellings bought and sold on the property market. The development each of these two main housing forms is then, in a sense, dependent on the other.

In addition, the role and organisation of the public housing companies differ within the Nordic context

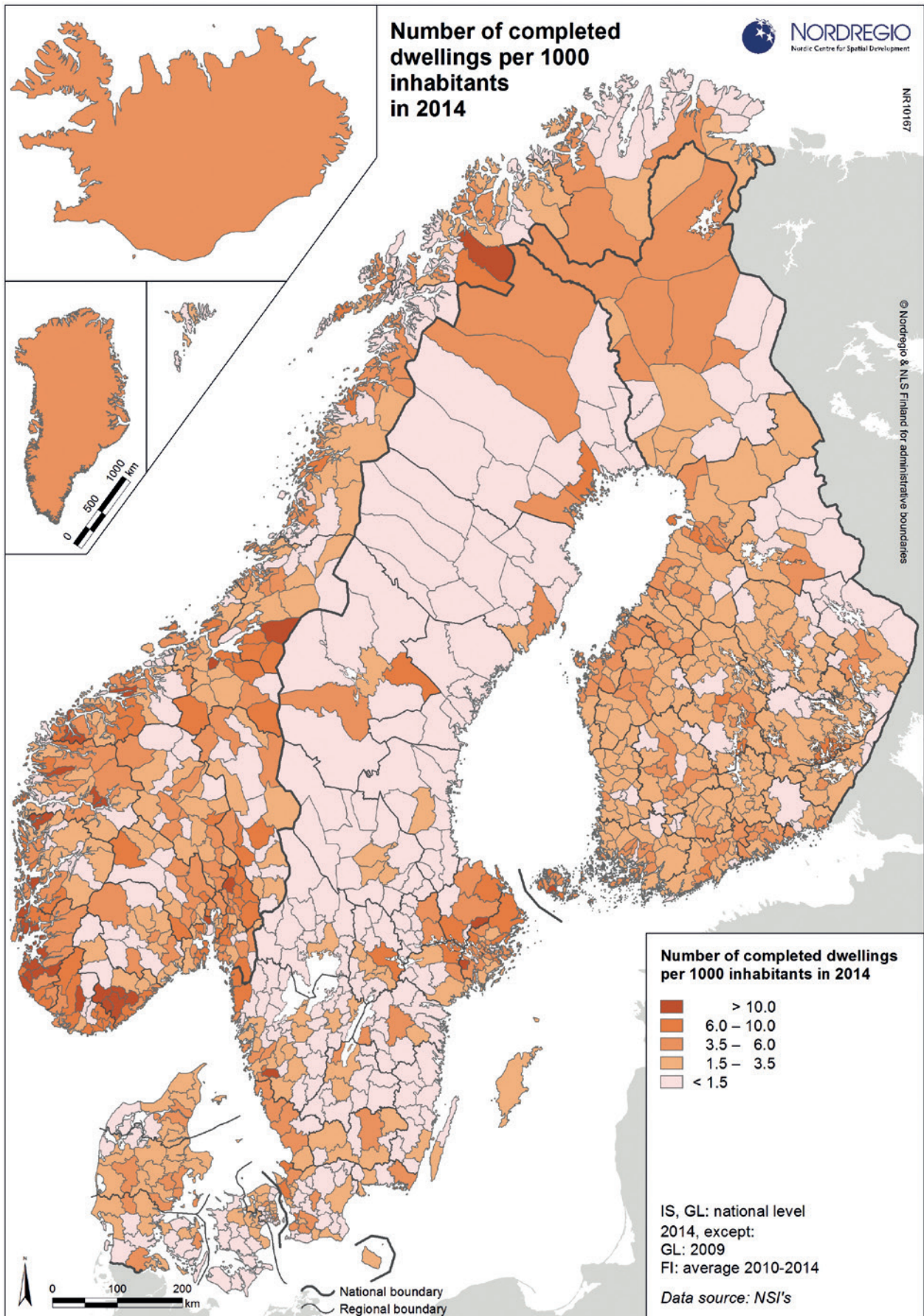


Figure 12.4: Number of completed dwellings per 1000 inhabitants in 2014

and the role and importance of social housing in the different countries significantly influences their housing markets (Bengtsson 2013, Boverket 2011). In Denmark and Sweden public housing companies providing rental housing (“almene boliger” and “allmännyttan”, respectively), while in Norway the central actor building ownership dwellings for economically weaker groups is Husbanken. In Finland rental housing is made available with support from the state (ARA) (Boverket 2011).

Consequently, in order to be able to compare, generalisations have to be made. The table on forms of tenure in 2014 (table 12.1) shows the relationship between rented and owner-occupied housing, but in order to show this several sub-categories have been merged. Rental housing includes state subsidised rental housing as well as all other public and private housing under rental tenure while the ownership category also includes co-operative ownership forms. On the national level a rather similar picture occurs across most of the Nordic countries with owner-occupied housing of different kinds making up the largest share, around two-thirds of all households with housing for rent making up the other one-third. In Denmark a small share of the ownership category is termed “andelsboliger” which is the Danish

form of co-operative ownership dwellings. In Sweden the largest share is ownership, followed by rental and co-operative ownership (“bostadsrätt”). This includes all forms of housing (apartments, detached houses, terraced houses, etc.).

As can clearly be seen Greenland provides a rather different model than the other countries as public, and thus rental, housing is the dominant form. Rental housing in Greenland is often owned by public organisations, for instance the national government or the municipalities, and in a few cases also by large companies (Rasmussen 2011, p.128). With its sparse population and harsh landscape, Greenland’s towns and settlements have often been described as islands, creating relatively limited and distinctly separate labour and housing markets (OECD 2011, p.71). In the Faroe Islands almost all dwellings are privately owned (Rasmussen 2011, p.128), as they are also in Iceland (though this not represented in table 12.1). In Iceland, housing ownership is seen as a secure investment in an otherwise “boom and bust economy” (Karlsdóttir 2013, p.48).

Regarding the generally smaller share of rental properties in all countries except Greenland there are important aspects of this issue that are not immediately visible in the table. In Denmark and Finland state subsidies plays a much stronger role, making it possible for these two countries to provide housing at lower cost. In Finland the private rental market was around 20 percent in 2014 and the share of state subsidised dwellings around 13 percent. Tenants in state subsidised dwellings are selected on the basis of social appropriateness and financial need, i.e. social housing. In Sweden there is, instead of social housing, a system of needs-tested rent grants to households in place with a similar function of lowering rent levels for social groups lacking adequate resources. In Norway, on the other hand, there is basically no public housing at all. Rental apartments (around 23 percent in 2011) are mainly owned by private persons, making the position of rental tenure very different from countries where it is public and/or state subsidised, or where landlords are the municipalities themselves, unions or other associations (see Bengtsson 2013 for a comparative discussion on this).

Figure 12.5 shows the number of rental dwellings per 100 owned dwellings in 2014. It is again a simplified division of all the housing types where the category rental includes state-subsidised, public and private rental dwellings and the category ownership includes co-operatively owned dwellings as well as individual ownership. According to this map – with the exception of Greenland - rental housing predominates or is strong mainly in municipalities in or near the bigger cities in Sweden, Denmark and Finland, for example in municipalities around Copenhagen such as Brønd-

Table 12.1: Forms of tenure in 2014.

2014	Rental * %	Ownership** %	Other %
Denmark	38.7	57.8	3.4
Finland	32.8	67.1	0.0
Sweden	38.2	61.8	0.1
Norway	22.8	77.3	0,0
Faroe Islands	13.5	80.8	5.8
Greenland	59.1	31.0	9.9

* (including social housing, public as well as private rental)

** (including co-operative ownership)

Source: NSI's. Harmonisation by Nordregio. Note: Faroe Islands and Norway: 2011. Greenland: 2010

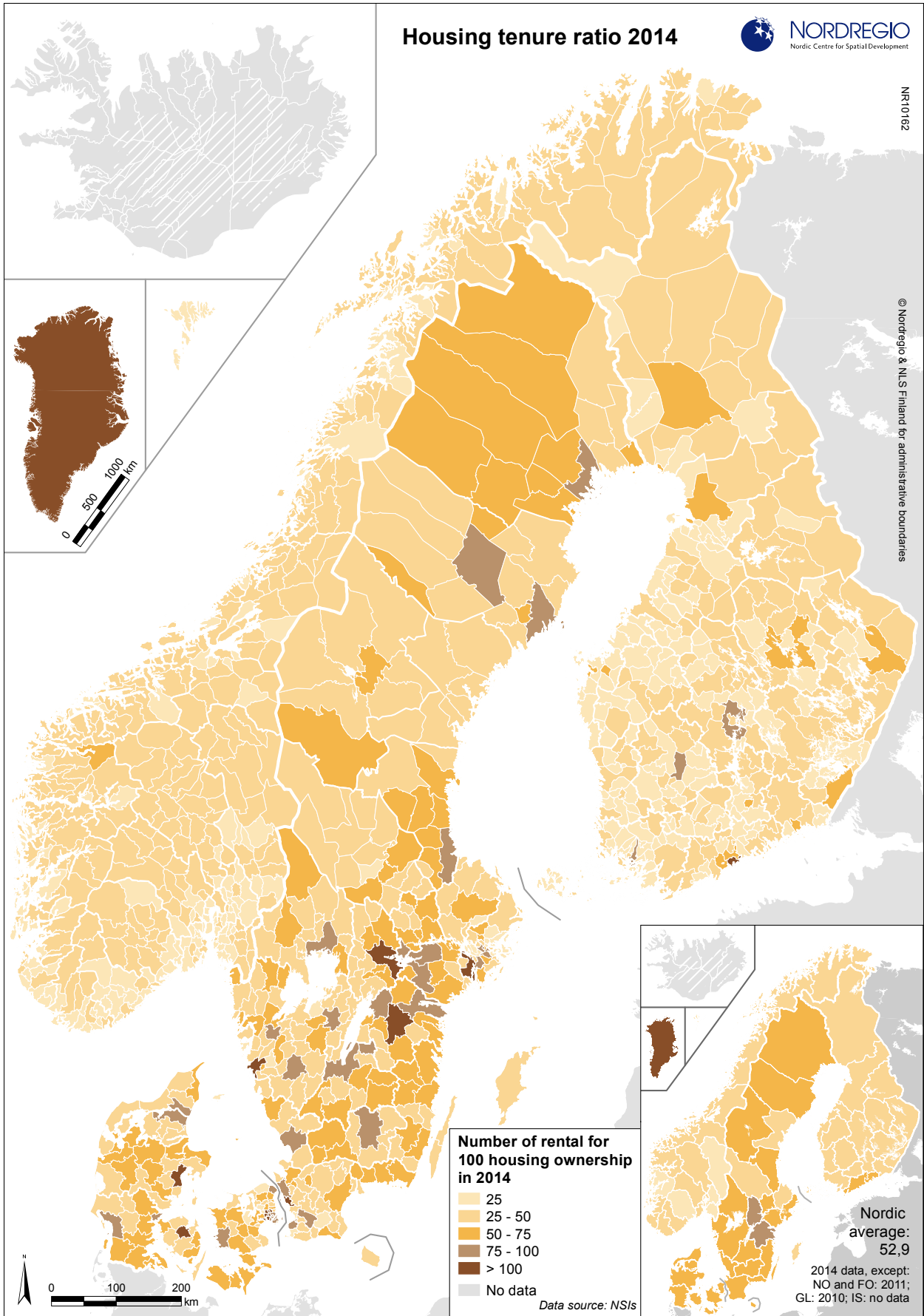


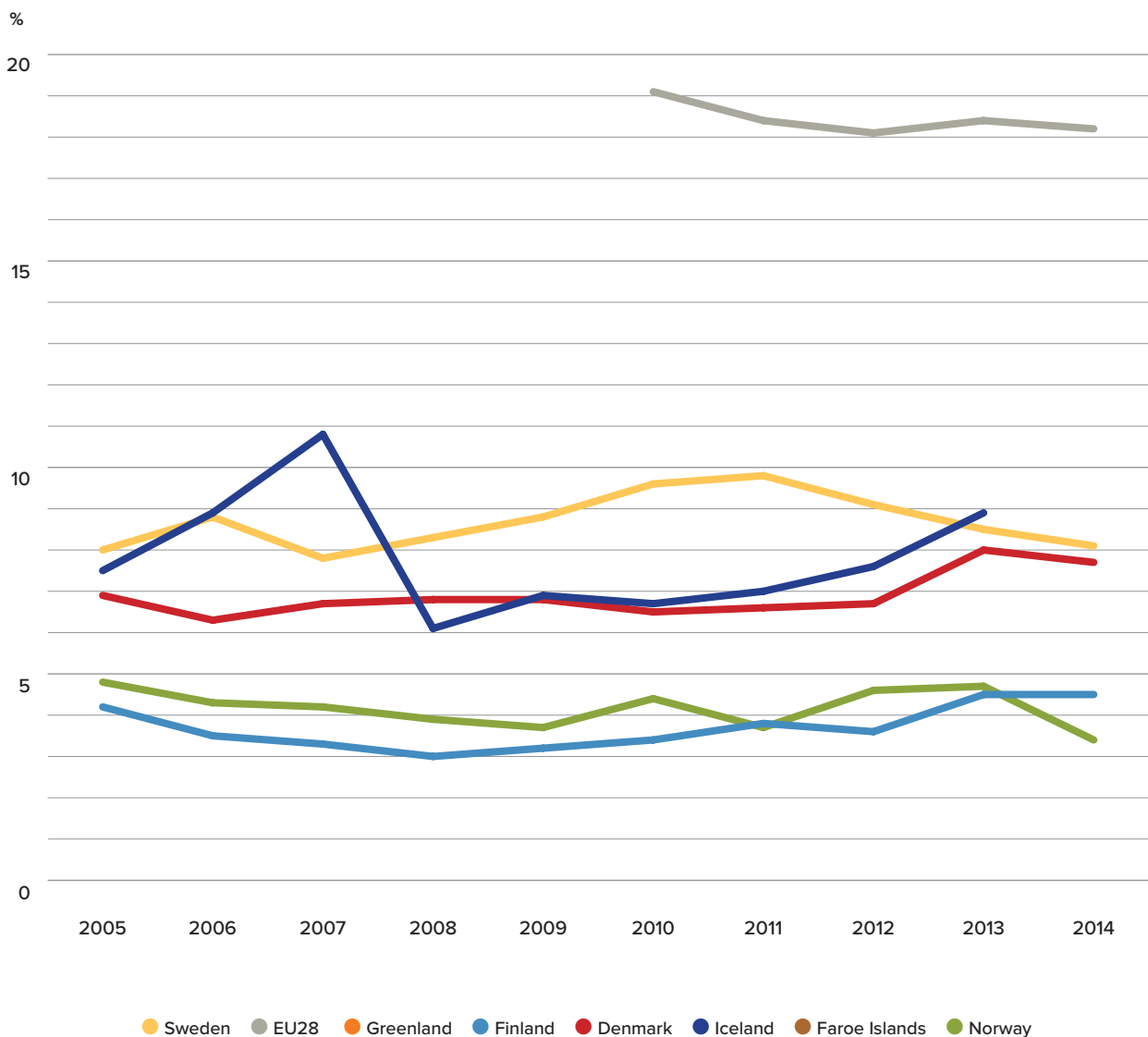
Figure 12.5: Housing tenure ratio 2014

by and Albertslund, in Södertälje and Sundbyberg in the Stockholm region and in Helsinki municipality. However, rental tenure is also dominant or strong in municipalities like Århus (Denmark), Fredericia (Denmark), Landskrona (Sweden), Turku (Finland) and Lycksele (Sweden). Overall however, housing ownership in different forms is strong in the Nordic countries. And although the map illustrates the entrenched position of housing ownership, it also illustrates the relatively stronger position of rental tenure in Sweden and Denmark in comparison to the other Nordic countries. In Norway, renting is primarily for the young and single, particularly in the cities (Statistics Norway 2015, p.18).

A strong relationship between overcrowding and poverty

A final variable presented here to illustrate the housing situation in the Nordic countries is that of overcrowding. As figures 12.6 and 12.7 illustrate there is a small gap between Norway and Finland with the smallest share of overcrowded population and Sweden, Denmark and Iceland with a somewhat larger share. The general picture of the Nordic countries is that crowding is much less of a problem here than in the European Union overall. It should however be emphasised that despite overcrowding being a relatively small problem nationally in the

Figure 12.6: Share of overcrowded households (excluding single-person households) 2005-2014



Nordic context it is, according to Statistics Sweden for example, more common among the foreign-born population in Sweden, and particularly those foreign-born from outside Europe (Statistics Sweden 2014a). This could be seen as an indication of segregation, in the sense that overcrowding is a consequence of the difficulties faced by ethnic minorities in getting into the regu-

lar housing market (Ahmed & Hammarstedt 2008). Note also in Figure 12.7 how overcrowded households correspond with those at risk of poverty (defined as the persons with less than 60 percent of the median income), clearly illustrating a very vulnerable group (i.e. often immigrants from outside Europe, living in crowded conditions and at risk of poverty).

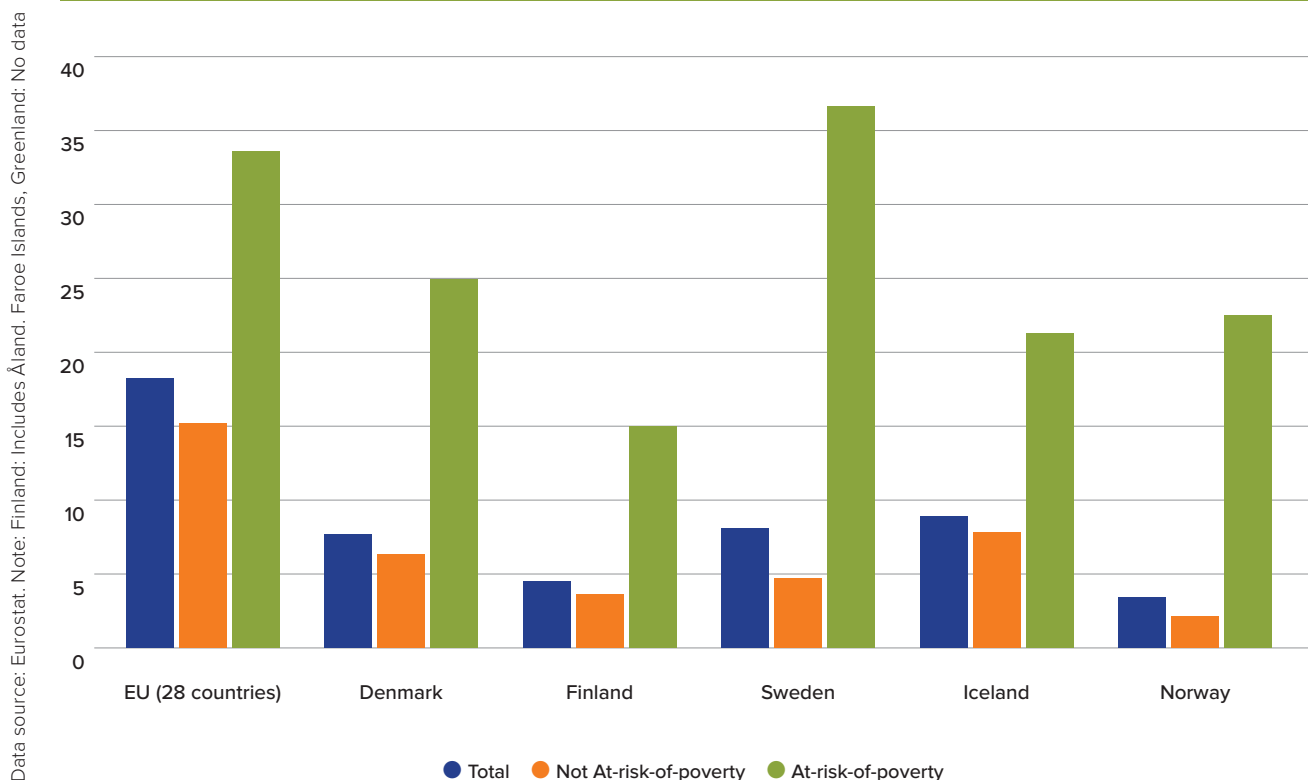
What counts as an overcrowded household?

Following Eurostat, an overcrowded household is defined as one which has fewer rooms than the sum of:

- one room for the household;
- one room per couple in the household;
- one room for each single person aged 18 or more;
- one room per pair of single people of the same gender between 12 and 17 years of age;
- one room for each single person between 12 and 17 years of age and not included in the previous category;
- one room per pair of children under 12 years of age.

Crowding can however be an indicator both of actual crowding due to the lack of affordable and/or adequate housing, and of a chosen “compact” lifestyle. In the data presented below single-person households have been excluded in order to gain a better picture of actual crowding due, perhaps, to the lack of affordable and/or adequate housing.

Figure 12.7: Share of overcrowded households (excluding single-person households) at-risk-of-poverty in 2014



Chapter 13

AIR ACCESSIBILITY:

Passenger numbers increasing, but the best is yet to come

Author: **Julien Grunfelder**

Maps and data: **Julien Grunfelder** and **Shinan Wang**

In 2014, nine airports located in Europe were included in the top 50 busiest airports in the world in terms of total number of passengers: none were located in the Nordic Region. Air traffic in Europe is largely dominated by five countries (France, Germany, Italy, Spain and the United Kingdom) which together absorb more than 60% of the total number of passengers. The Nordic Region's peripheral location and, in a broader European context, relatively low densities of both people and cities, result in a relatively low number of air passenger journeys being undertaken. In 2014, the share of air passengers in the Nordic Region was 13.7% of all passengers in European airports (12.2% in 2008). Looking at the European scale, Copenhagen-Kastrup is 15th, Oslo-Gardermoen is 17th, Stockholm-Arlanda is 21st and Helsinki-Vantaa is 30th.

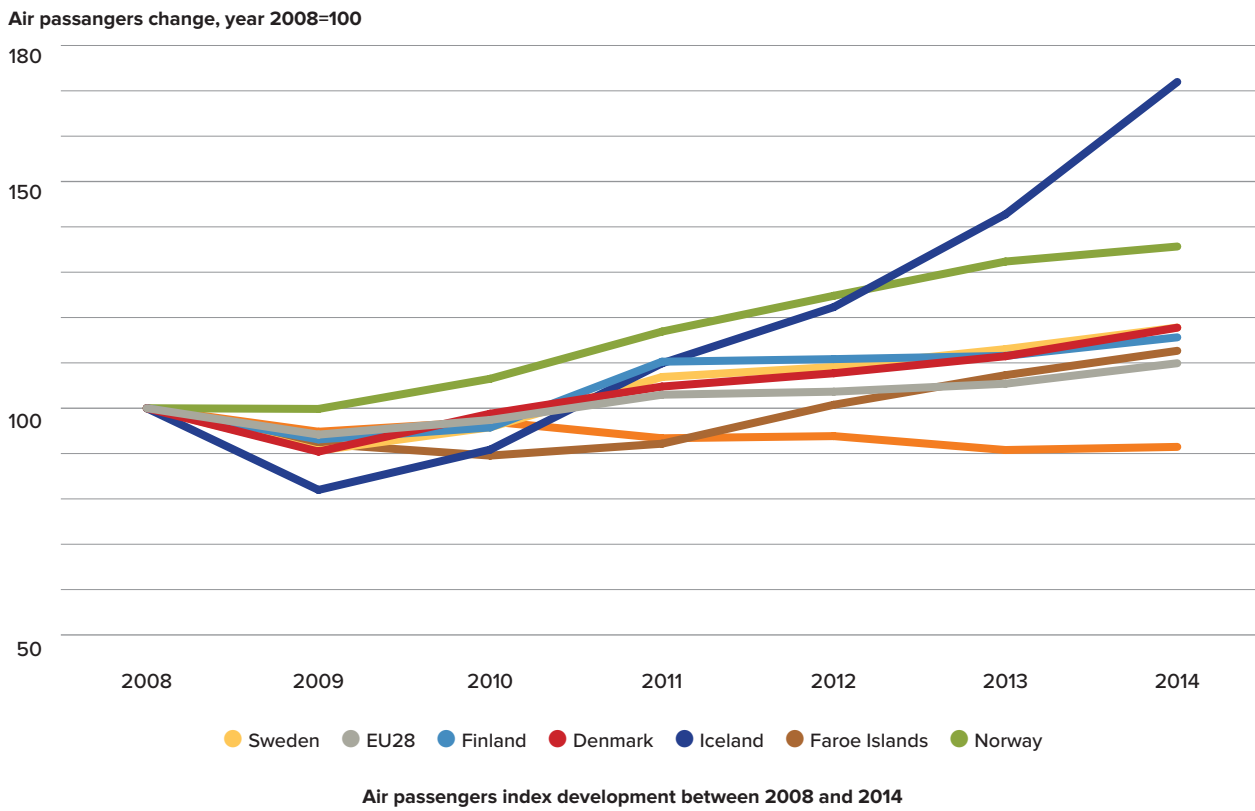
Rising passenger numbers and substantial growth potential

Despite its relatively unimpressive performance in terms of absolute passenger numbers, air traffic volumes routing through Nordic airports suggest that the market remains underdeveloped, i.e. characterised by its immaturity. In other words, opportunities for growth remain in volume terms of across the vast majority of Nordic Region airports. This stands in stark contrast to those countries with mature airports where the capacity for growth is very limited (for instance: Paris-Charles de Gaulle and London-Heathrow). The figure 13.1 shows air passenger development for the Nordic countries and territories and for the EU28 for each year between 2008 and 2014, using the year 2008 as a reference. Since 2011, the increase in air passenger numbers has been higher in all the Nordic countries and the Faroe Islands than the European Union average, and has been

largest in Iceland and Norway. This immaturity is clearly highlighted in the data on air passenger development, where all of the Nordic countries have a growth above the EU28 average of 9.9% for the period. Since 2012 Iceland has had the strongest increase reaching an index value of 172 in 2014. Norway has experienced a period of continuous increase since 2008 and attained an index value of 136 in 2014. Finally, Denmark, Finland and Sweden all developed rather similarly in terms of air passenger numbers during this period with each having index values around 117 in 2014. A recent study (European Commission, 2015) states that Denmark and Sweden are expected to see annual growth between 2-4% in the coming years. Iceland will have an even more impressive annual growth above 6% up to 2020, whereas Finland and Norway will only see an annual growth rate of 1-2%. The graph (figure 13.1) also shows that, with the exception of Iceland, the 2008 financial crisis has had only a limited impact on air traffic in the various domestic markets of the Nordic Region.

One of the reasons for the rapid growth in air passenger numbers in the Nordic countries since 2011 is the new strategies adopted by airports and airlines. Some of the airports and airlines based in the Nordic Region used their peripheral but strategic location in a European context as a natural competitive advantage to market themselves as gateways to other continents. This has been the primary strategy in both Finland and Iceland. The pairing of Finnair/Helsinki-Vantaa airport succeeded in marketing themselves as the gateway to Asia, offering the shortest route between Europe and East Asia and very efficient transit. Similarly, Icelandair/Keflavik airport produced a similar strategy as a new gateway to North America. It is also worth mentioning here the growth of the airline Norwegian Air Shuttle which has, since 2008, on a budget carrier basis significantly increased the number

Figure 13.1: Air passengers by country for commercial flights in the Nordic countries



Data source: Eurostat, Statistics Greenland, Statistics Faroe Islands.
Note: Finland: Includes Åland

of operations and passengers in its two main Nordic hubs (Oslo Gardermoen and Stockholm Arlanda airports)

These new strategies developed by various Nordic airports and airlines have significantly increased air accessibility between the Nordic countries and other continents, via the main airports of the capital cities in each Nordic country. Figure 13.2 highlights intercontinental routes with an origin or destination in the main airport of each capital city in the Nordic countries. The map only includes direct scheduled commercial flights (situation as of January 2016) having at least one weekly flight. In other words, it does not include connecting flights, charters or cargo routes. Both North America and East Asia are relatively well connected to the Nordic countries, as are the Middle East and South East Asia, though to a lesser extent. A number of these intercontinental routes have been established quite recently, particularly those with the Middle East and Asia most of which were opened between 2011 and 2015. Routes to Africa and South America are more problematic to operate as the Nordic countries have no comparative advantage in developing them, hence the limited number of routes to the former and the complete lack of any routes at all to the latter.

Air transport in the Nordic countries is also characterised by strong moral and regulatory pressure towards

the creation of more energy efficient operations, initiated by both the public and the private sectors (World Bank, 2012). The public sector contributes by means of various fiscal and policy measures, while the private sector contributes by using new, less pollutant emitting, planes (Norwegian Air Shuttle has one of the newest fleets in the world, while Finnair is the first European airline to buy and operate the new Airbus A350) and by employing such practices as for instance the continuous descent operations to reduce emissions during landing.

Supporting regional development through increased air traffic

It is generally acknowledged that airports have a significant effect on regional economic development. In our contemporary service-dominated societies, moving people has a bigger effect on the economic development of regions than moving goods (Florida, 2012), hence the importance of good air accessibility for the population. An increase in the air accessibility of a region results in the creation of jobs; not only direct jobs, but also indirect, induced and catalytic jobs (SEO, 2012). The number

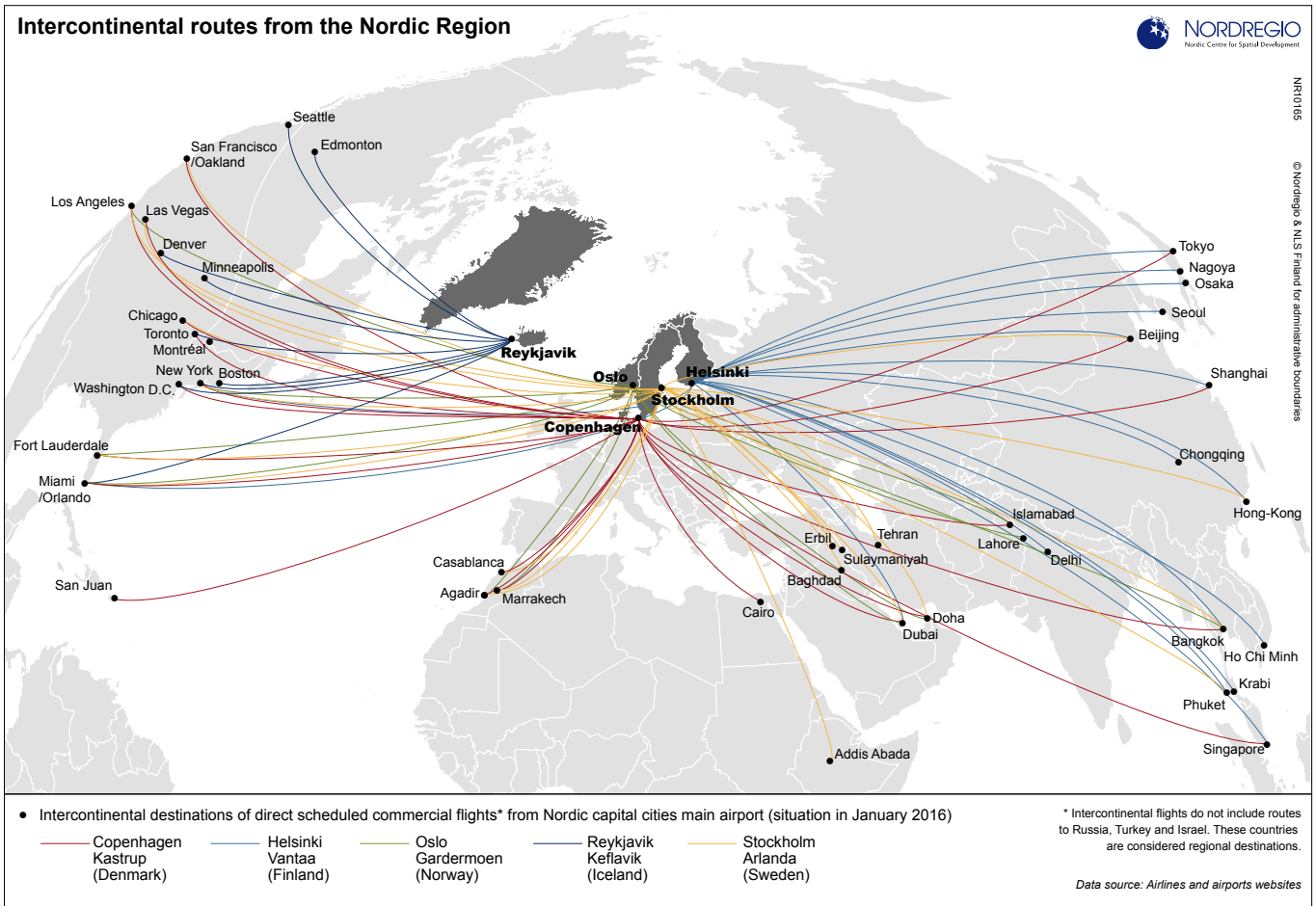


Figure 13.2: Intercontinental routes from the Nordic countries (direct scheduled intercontinental routes only)

of jobs in the Nordic Region generated by airport activities amounted to 612 800 in 2013 and their total contribution to national GDP varies from 4% in Norway to 9.5% in Iceland (InterVistas, 2015).

Almost 150 million passengers travelled through the airports of the Nordic Region in 2014, which means an increase of 22% since 2008. Approximately two thirds of the passengers were international (a 28% rise since 2008) while 60% of the total number of passengers travelled through one of the four largest airports (Copenhagen-Kastrup, Oslo-Gardermoen, Stockholm-Arlanda and Helsinki-Vantaa).

The organisation of air traffic flows is reflected in the number of domestic and international passengers in the airports of the Nordic Region. The map on domestic and international air passengers in 2014 (figure 13.3) shows that the majority of international passengers are found in a limited number of airports, mostly in the capital city airports plus a couple of metropolitan area airports. Denmark produces a slightly different pattern where the share of domestic passengers is rather low

in its two largest airports, located in Copenhagen and Billund. This can, in part, be explained by the relatively small size of the country where domestic transport distances do not favour air traffic with the exception of that between Copenhagen and Aalborg where air traffic has a competitive advantage, resulting in a large share of domestic passengers at Aalborg airport.

It is also generally acknowledged that accessibility is more important than location (Rasker et al, 2009). This is particularly true for remote regions particularly for those in the Nordic Region, where airports participate significantly in the integration of these more physically distant regions. Air accessibility also has a significant social impact in these regions. For instance, it contributes to the maintenance of local services and it reduces the local population's feeling of peripherality, contributing to the creation of a strong general desire not to leave the region. The map on domestic and international air passengers per airport in the Nordic Region in 2014 (figure 13.3) also highlights the importance of small and medium sized airports for domestic passengers in the

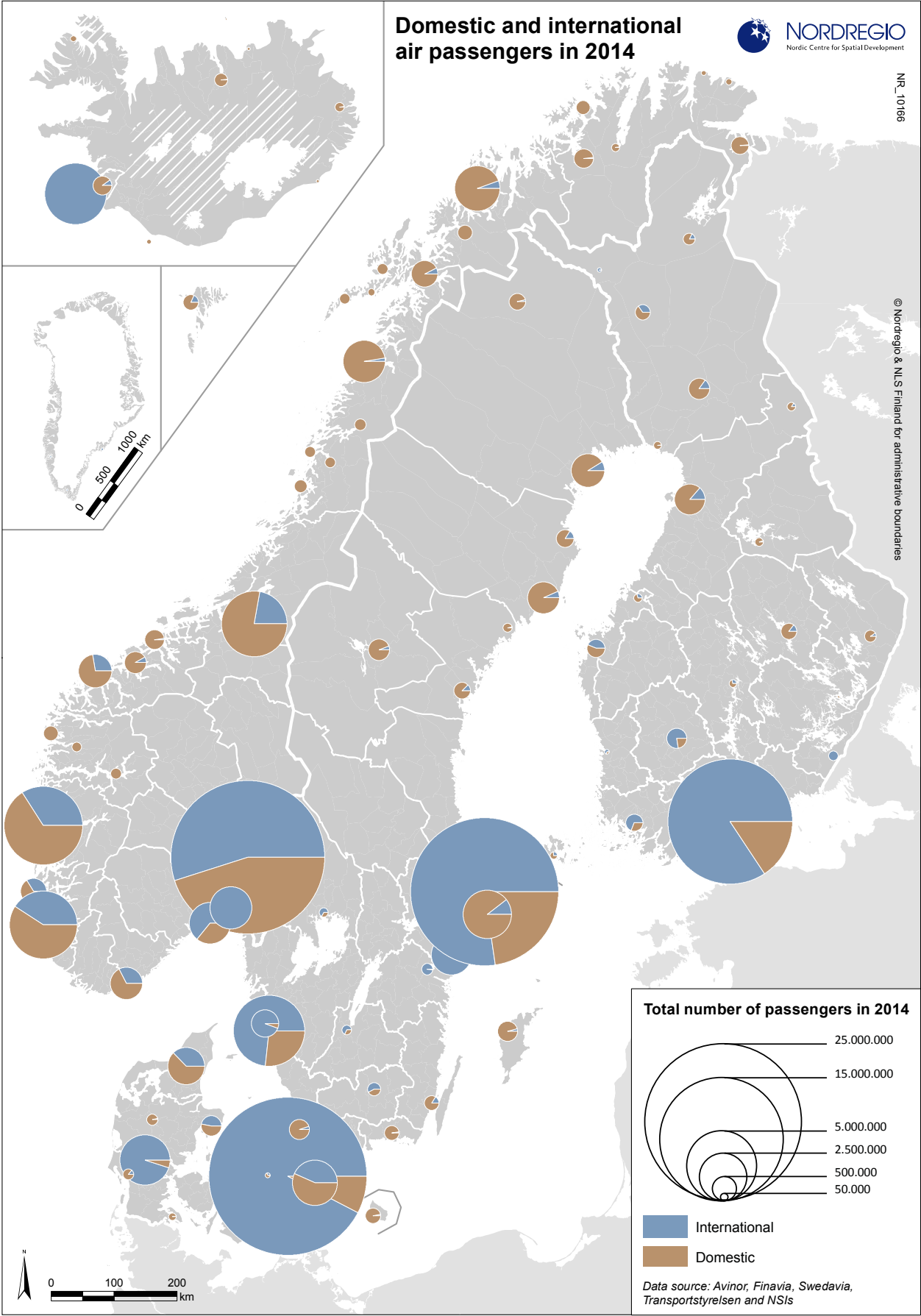


Figure 13.3: Domestic and international air passengers per airports in the Nordic Region in 2014

Figure 13.4: Total number of passengers per commercial airport in 2014

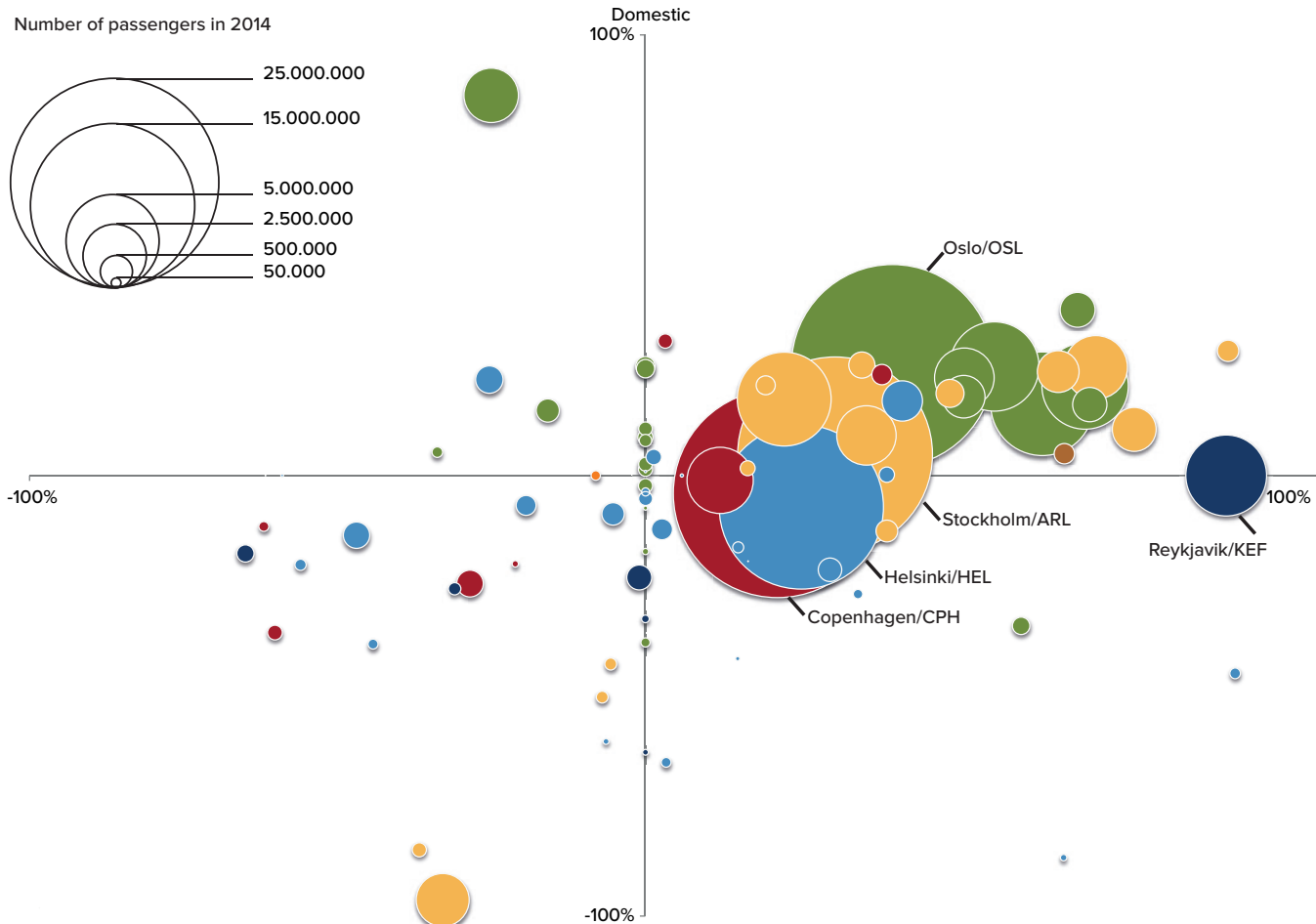


Figure 13.4: Total number of passengers per commercial airport in 2014, and domestic and international air passenger changes between 2008 and 2014 per commercial airports in the Nordic Region

northern parts of Norway, Sweden and Finland, as well as most of Iceland (with the exception of its capital region). The most remote areas of the Nordic Region undoubtedly suffer from a lack of transport infrastructure, mainly due to the low population densities, as well as the relatively long distances between urban settlements. These areas can also be challenged by both their topography and climate. As a consequence, these remote regions have no realistic alternative to air transport in terms of accessing the health and other public services lacking in their regions. Hence the population in these remote parts of the Nordic Region often displays a relatively higher number of domestic flights per inhabitant than national averages for the Nordic countries (Halpern & Bråthen, 2011). In terms of healthcare issues, population growth in these

peripheral regions is more dependent on access to air transport than less remote regions. Air transport is thus the most viable option from a cost-benefit perspective for both patients and authorities (Halpern & Bråthen, 2011). Public subsidies for air routes are one solution to ensuring access to and from remote regions. In Norway, public subsidies through public service obligation (PSO) strongly contribute to the existence of domestic air routes. Indeed, Norway has the largest number of PSO routes in Europe (Bråthen, 2011) with a number of airports exclusively relying on PSO traffic, such as Hammerfest and Leknes (Bubalo, 2012).

Finally, the relatively large share of international passengers outside the capital regions can be explained by the existence of charter flights.

Data sources: Airlines' webpages, Avinor, Finavia, Swedavia and Transportstyrelsen.

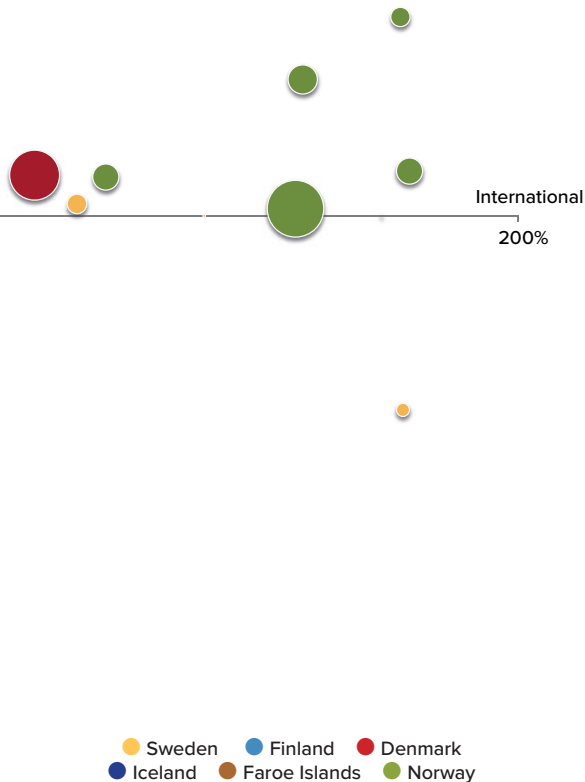


Figure 13.4 highlights changes for all types of flights (scheduled and charters) between 2008 and 2014 separated between domestic (vertical axis) and international passengers (horizontal axis) of all the commercial airports in the Nordic Region. Each colour corresponds to a country or territory of the Nordic Region and the size of the circles is proportional to the total number of passengers for each airport in 2014. The graph indicates growth in both domestic and international passengers for airports in Norway, as well as in Sweden, but to a lesser degree. The situations in Denmark, Finland and Iceland are rather similar with the main airport(s) seeing an increase in both domestic and international air passengers, while most of the other airports are either stagnating or suffering declines in both types of air

Complementarity between airport and high speed train services

The high speed rail network (maximum speed of 200km/h and more) in the Nordic Region is rather limited compared to that of other European countries such as France, Spain and Italy. A number of projects to either update existing tracks or build entirely new sections for high speed train services are in their planning phases or under development, such as the line between Stockholm and Linköping in Sweden, that between Copenhagen and Fehmarn Belt in Denmark and between Helsinki and Turku in Finland. However, three of the Nordic countries have been particularly successful at integrating the two modes of transport (rail and air) by developing efficient rail services to their main airports. Oslo-Gardermoen airport has often been cited as the best example in the world of the integration of public transport (64% market share in 2008), which includes high speed train services with a market share of 39% (Transport Research Board, 2008). Stockholm provides another well-known example of such service integration with the 20 minute connection between Stockholm's main train station and Stockholm-Arlanda airport. Copenhagen Kastrup airport is also well integrated to the rail service network, even though most of the train traffic is not high speed train services (the only high speed trains are the X2000 coming from Sweden and crossing the Öresund). Helsinki Vantaa has recently been connected to the local commuter rail network, which allows connecting to the high speed train line to St. Petersburg with a change at Helsinki main train station and a joint ticketing.

passengers. The graph also shows that a number of very small airports have seen significant reductions in both domestic and international passengers. The graph also indicates that growth has mostly occurred in the main hub in each country. Finally, the growth of international passengers in small airports corresponds to the introduction of charter destinations to southern Europe.

The purpose of the Regional Potential Index

Rankings and indexes are developed for many different purposes. One example from the EU level is the ranking of regions to define eligible areas for structural funds based on GRP levels in the past. National rankings are created to show the most favourable business climate or the best place to live.

The purpose of Nordregio's Regional Potential Index is to show the current performance of the 74 administrative regions of the Nordic countries; to identify regions with high potential for future development and their common denominators; and to identify regions in need of further support and policy measures to strengthen their potential and meet existing challenges. Last but not least, the index provides policy-makers with insights on regional strengths and weaknesses, and could be used for comparative learning between Nordic Regions with similar geographies but different outcomes in the ranking when it comes to creating effective regional development strategies.

THEME 5
**MEASURING
REGIONAL
POTENTIAL**

Chapter 14

NORDREGIO'S NEW REGIONAL POTENTIAL INDEX

Authors: **Gunnar Lindberg, Åsa Ström Hildestrand and Julien Grunfelder**
 Map and data: **Julien Grunfelder**

This report gives plenty of insights to what impacts regional development. In previous chapters, we have shown you how the 74 Nordic Regions perform in a range of important indicators. But, which regions stand tallest when it comes to core economic, demographic and employment indicators – and thus have the greatest potential for future growth and development? For the first time in this report series, Nordregio has constructed a Regional Potential Index (RPI) for all 74 Nordic Regions. And the top performer 2015 is Oslo, the Norwegian capital region, closely followed by two other capital regions: Hovedstaden in Denmark and Stockholm in Sweden. Just as interesting though, in terms of future potential, are the fastest climbers in the ranking, for instance the regions of Troms and Nord-Trøndelag in Norway and Jönköping in Sweden.

In the end of the chapter, we explain in detail how the RPI was constructed, what it measures (see list of indicators in table 14.4) – and how it can be useful for regional developers and planners. A general conclusion is that the top section of the ranking list (see table 14.1) is quite predictable in a time of continuous urbanisation, globalisation and digitalisation. Regions that are able to attract the most human and innovation capital come out strongest also in terms of future growth potential. Most of these are big city regions, but not all of them – Åland is one clear deviation to the rule. Despite their strengths, the top regions are not without challenges, particularly with respect to labour market potential. But, the regions found at the lower end of the ranking certainly have more challenges to address. Many have struggled for years with negative population trends and/or negative economic development.

which regions stand tallest when it comes to core economic, demographic and employment indicators – and thus have the greatest potential for future growth and development?

Table 14.1 Regional Potential Index

2015 rank (2010 rank)	Region	Regional potential	Demographic potential	Labour market potential	Economic potential
1 (3)	Oslo (NO)	758	278	190	290
2 (1)	Hovedstaden (DK)	756	286	170	300
3 (4)	Stockholm (SE)	753	263	190	300
4 (2)	Akershus (NO)	748	248	260	240
5 (5)	Helsinki-Uusimaa (FI)	738	278	180	280
6 (6)	Rogaland (NO)	728	188	270	270
7 (10)	Sør-Trøndelag (NO)	703	173	260	270
8 (7)	Hordaland (NO)	685	165	240	280
9 (9)	Uppsala (SE)	618	218	180	220
10 (8)	Höfuðborgarsvæðið (IS)	598	248	220	130
11 (12)	Åland (AL)	595	195	210	190
11 (11)	Vest-Agder (NO)	595	195	190	210
13 (14)	Västra Götaland (SE)	588	188	140	260
14 (32)	Troms (NO)	578	128	230	220
15 (16)	Buskerud (NO)	568	158	210	200
16 (14)	Møre og Romsdal (NO)	553	113	220	220
17 (19)	Midtjylland (DK)	535	195	130	210
18 (21)	Suðurnes (IS)	526	226	150	150
19 (20)	Vestfold (NO)	516	226	160	130
19 (18)	Skåne (SE)	516	226	110	180
21 (22)	Sogn og Fjordane (NO)	498	68	250	180
22 (25)	Syddanmark (DK)	480	180	100	200
23 (17)	Pirkanmaa - Birkaland (FI)	465	165	130	170

24 (34)	Halland (SE)	463	203	180	80
25 (38)	Österbotten - Pohjanmaa (FI)	460	90	180	190
26 (13)	Varsinais-Suomi - Egentliga Finland (FI)	448	188	130	130
26 (21)	Suðurland (IS)	448	128	170	150
28 (31)	Östergötland (SE)	440	150	100	190
29 (23)	Norðurland eystra (IS)	428	128	150	150
30 (43)	Örebro (SE)	418	158	100	160
30 (47)	Jönköping (SE)	418	128	150	140
30 (41)	Kronoberg (SE)	418	128	110	180
33 (37)	Nordjylland (DK)	415	165	100	150
33 (46)	Västerbotten (SE)	415	105	160	150
35 (23)	Norðurland vestra (IS)	413	83	180	150
35 (24)	Austurland (IS)	413	83	180	150
37 (41)	Nordland (NO)	410	90	150	170
38 (30)	Norrbottnen (SE)	408	68	140	200
39 (26)	Vesturland (IS)	405	105	150	150
40 (56)	Finnmark (NO)	403	113	140	150
41 (28)	Vestfirðir (IS)	400	90	160	150
42 (48)	Oppland (NO)	390	120	180	90
42 (36)	Telemark (NO)	390	120	130	140
44 (29)	Aust-Agder (NO)	388	158	130	100
45 (43)	Västmanland (SE)	383	173	90	120
46 (50)	Faroe Islands (FO)	378	98	230	50
46 (63)	Nord-Trøndelag (NO)	378	98	200	80
48 (26)	Sjælland (DK)	368	188	90	90
49 (29)	Østfold (NO)	365	195	100	70

50 (61)	Västernorrland (SE)	343	83	110	150
51 (51)	Hedmark (NO)	338	128	130	80
52 (53)	Södermanland (SE)	330	180	70	80
53 (43)	Kanta-Häme - Egentliga Tavastland (FI)	310	120	120	70
53 (53)	Dalarna (SE)	310	90	100	120
55 (70)	Jämtland (SE)	305	75	160	70
55 (39)	Pohjois-Pohjanmaa - Norra Österbotten (FI)	303	83	120	100
57 (67)	Gävleborg (SE)	298	128	70	100
58 (69)	Gotland (SE)	295	135	110	50
59 (55)	Blekinge (SE)	285	135	90	60
59 (58)	Satakunta (FI)	285	105	70	110
61 (49)	Keski-Suomi - Mellersta Finland (FI)	283	113	90	80
62 (60)	Kalmar (SE)	280	120	100	60
63 (57)	Etelä-Karjala - Södra Karelen (FI)	275	75	90	110
64 (52)	Päijät-Häme - Päijänne-Tavastland (FI)	270	150	80	40
65 (65)	Pohjois-Savo - Norra Savolax (FI)	255	105	90	60
65 (66)	Keski-Pohjanmaa - Mellersta Österbotten (FI)	255	75	110	70
67 (64)	Greenland (GL)	248	98	60	90
68 (68)	Värmland (SE)	238	98	70	70
69 (71)	Pohjois-Karjala - Norra Karelen (FI)	220	90	80	50
70 (72)	Etelä-Pohjanmaa - Södra Österbotten (FI)	208	68	100	40
71 (73)	Etelä-Savo - Södra Savolax (FI)	205	75	90	40
72 (62)	Kymenlaakso - Kymmenedalen (FI)	200	90	60	50
73 (69)	Lappi - Lappland (FI)	198	68	70	60
74 (74)	Kainuu - Kajanaland (FI)	135	45	60	30

The ranking results from a Nordic, comparative perspective

Norwegian regions perform well in the ranking overall. We can see some particularly strong results from regions with industries, businesses and services related to oil and gas extraction, a trend that is probably about to break, considering the decreasing oil prices. Denmark and Iceland also have a large proportion of regions with high regional growth potential. In Sweden and Finland the domestic variation between the strongest and weakest regions is greater. Sweden, for example, scored very well around the capital and also along the west coast, while the three south-eastern most regions Blekinge, Kalmar and Gotland, which include Sweden's largest islands (see figure 14.1) scored relatively poor, largely due to lower scores on economic indicators.

In Finland, many regions received lower rankings, specifically in the eastern and northern parts. The picture here is even more diverse than in Sweden. Some regions scored well on demographic potential but were low on both economy and labour force potential while others scored low on all three dimensions.

One thing to remember at this point is that we are studying regions within the Nordic Region which is relatively cohesive compared to many other European regions. Since the ranking is normalised, the regions are allocated scores in relation to the best and worse regions in the sample. That means that the region with the lowest value of an indicator is allocated 10, while the

best value is 100. All other values are scored in between those based on relative values of indicators. In short: the difference between regions in the ranking can be perceived as larger than the absolute differences between regions.

The reader of the ranking should also be reminded that the ranking is based on data from national statistical institutes, which do not include data on cross-border commuters and business. Consequently, a couple of regions located along national borders (e.g. between Norway and Sweden) would most probably have performed better if cross-border data would have been included.

Top movers since 2010

Another important aspect of indexes and rankings is of course to create them repeatedly to show trends or movements in the ranking list. This is particularly instructive when we consider the capacity of the ranking to capture both the current situation and potential for future regional growth. As you can see in table 14.2, some regions including Troms (Norway), Jönköping (Sweden) and Nord-Trøndelag (Norway), have climbed impressively when comparing scores from the 2010 ranking with the 2015 ranking. These have a common denominator in that they are quite far from the capitals, with the Norwegian regions have increasing their GRP/capita and the Swedish regions reducing their youth unemployment and increasing their share of people aged 25-64 with high education degree.

There are also a number of regions that are losing scores (see table 14.2) or scoring low both 2010 and 2015 (see bottom of table 14.1). These are apparently at a worse place when it comes to indicators describing economy, demography and labour market. Common for many of them is that they display higher youth unemployment and lower but still positive net migration rates, which in turn means lower growth potential for years to come and thus greater challenges when it comes to implementing strategies and measures for regional development.

There is certainly scope for further analysis of regions that have shown dramatic shifts in the ranking, to investigate the mechanisms at work in the region, both before and during the measurement period. Nordregio sees potential for an inter-regional dialogue that would enable learning between high-scoring and low-scoring regions with similar geographies (see below), but different regional development strategies. Successful strategies could perhaps be implemented elsewhere. Some regions might also be interested in going deeper into which indicators they have evolved in, and the story behind this development. Where regions have slipped in the ranking, greater understanding of contributing factors may be useful in preventing further decline.

Table 14.2
Top movers 2010-2015

Top 5 climbers

Troms (NO), +18
Jönköping, (SE) and
Nord-Trøndelag (NO), +17
Finnmark (NO), +16
Jämtland (SE), +15

Top 5 drops

Sjælland (DK), -22
Østfold (NO), -20
Pohjois-Pohjanmaa/
Norra Österbotten (FI), -16
Aust-Agder (NO), -15
Vesterland (IS) and
Varsinais-Suomi-Egentliga Finland (FI), -13

Table 14.3 Top 5 by regional typology

Top 5 Rural regions

(based on the ESPON CU Urban Rural typology 2011)

11. Åland (AL)
14. Troms (NO)
16. Møre og Romsdal (NO)
18. Suðurnes (IS)
21. Sogn og Fjordane (NO)

Top 5 Northern Sparsely Populated Areas

(includes the northern regions of Finland, Norway and Sweden)

14. Troms (NO)
33. Västerbotten (SE)
37. Nordland (NO)
38. Norrbotten (SE)
40. Finnmark (NO)

Top 5 Intermediate regions

(based on the ESPON CU Urban Rural typology 2011)

6. Rogaland (NO)
7. Sør-Trøndelag (NO)
8. Hordaland (NO)
9. Uppsala (SE)
10. Hövuðborgarsvæði (IS)

Top 5 Nordic Arctic regions

(as defined in the Arctic Human Development Report)

10. Hövuðborgarsvæði (IS)
14. Troms (NO)
18. Suðurnes (IS)
26. Suðurland (IS)
29. Norðurland eystra (IS)

The diverse geography of Nordic Regions

The Nordic Region is a diverse geographical unit displaying everything from metropolitan urban regions to remote rural regions and even Arctic regions. Hence, it is useful to compare the rankings of regions which share similar geographical characteristics. In order to make this comparison, four typologies have been developed spanning different types of geographies: Rural; Northern sparsely populated; Nordic Arctic regions and Intermediate regions (regions including at least one bigger city but not the capital, except for Iceland). These are shown in Table 14.3, including the five top-scoring regions for each.

Sweden's rural regions perform well in general, but not on par with the rural top-performers found in Norway and Åland. Among the NSPA regions, Sweden and Norway perform better, while Finnish regions (as already highlighted) perform at the lower end of the

scale. For the Arctic regions, the comparison becomes a bit "unfair" as Höfudborgarsvæði and Suðurnes for instance are capital city regions, while some others are more rural Arctic regions. Finally, among the Intermediate regions, Norway again comes out very strong.

The ranking does not take into account any qualitative dimensions, such as experienced life quality.

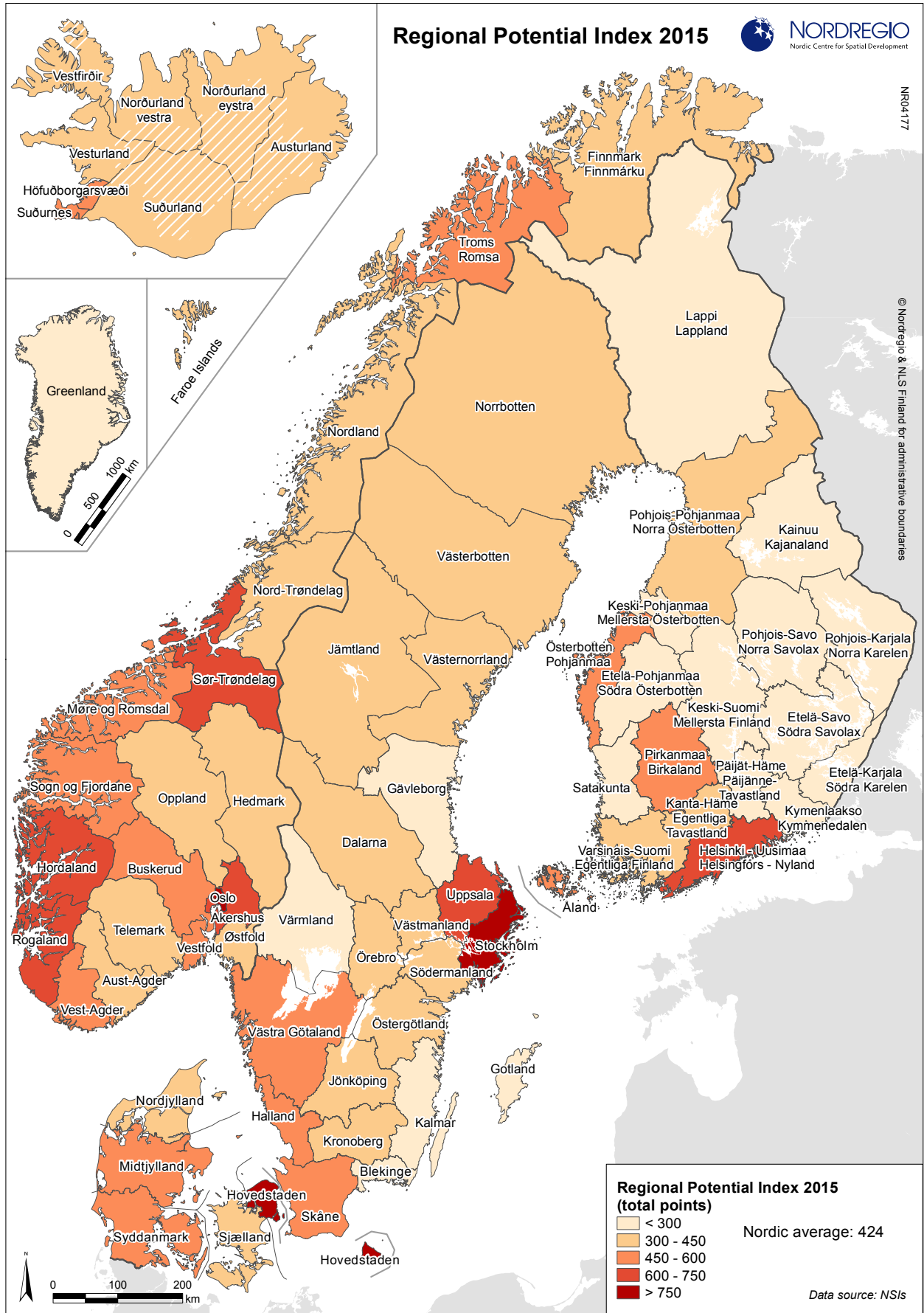


Figure 14.1: Territorial potential 2015. Note: Bornholm (DK) is part of Hovedstaden, Denmark's capital administrative region

Methodological elements of The Regional Potential Index

Nordregio's Regional Potential Index is made up of indicators that have been carefully selected because of their implications for regional or territorial development. The data has been harmonised and standardised and is drawn from a solid data base that covers a long period of time and many geographical levels. The selected indicators do not have high correlation and only a limited amount of data sources had gaps. The selected indicators also offer strong communicative value allowing the ranking to be easily understood and widely used in the regional development context. Much of the data included in the ranking is drawn on in other chapters of this report and is also available on NordMap. The three themes, related indicators and weighting can be seen in Table 14.4.

As can be seen in Table 14.4, GRP/capita is weighted more heavily than the other indicators. The reason for this is that it has historically been determined as perhaps the most relevant measure of both current performance and future development of a region. Total score for demographic potential has also been modified to have a total score of 300, consistent with the other two themes, by allocating

between 7,5 and 75 points for each indicator. Indicators connected to environmental values are not included in this ranking. This is mainly due to relatively small differences within the Nordic Region, when comparing with other parts of the world (except soil sealing).

Despite the rigorous process through which the ranking was developed, some limitations remain and the ranking should be understood from a rather instrumental point of view: Firstly, the ranking does not include cross-border data. Consequently, regions located on national borders where workers commute to work in another country (e.g. Värmland in Sweden) and may have received lower rankings than if cross-border data was considered. Secondly, due to a lack of good, quality recent data for a number of regions, the ranking does not include indicators of accessibility. Finally, the ranking does not take into account any qualitative dimensions, such as experienced life quality, or the existence of regional development or smart specialisation strategies. It also doesn't give any advice on what would be required in the future in order for regions to build on the dimensions included in the index.

Table 14.4 Indicators included in the index and their respective weights

Theme	Indicators	Points allocated
Demographic potential	Population density	7,5-75
	Net migration rate	7,5-75
	Demographic dependency rate	7,5-75
	Female ratio	7,5-75
Labour market potential	Employment rate	10-100
	Share of the age group 25-64 with high education degree	10-100
	Youth unemployment rate	10-100
Economic potential	GRP/capita	20-200
	Total R&D investments	10-100

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