

Territorial Observation No. 10
February 2014

10

Potentials and Challenges for Iceland, Liechtenstein, Norway and Switzerland - and for the European Union



ESPON 2013 Programme

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This publication is part-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland. The Managing Authority responsible for the ESPON 2013 Programme is the Ministry for Sustainable Development and Infrastructures of Luxembourg.

The present publication was processed by the ESPON Coordination Unit, supported by a drafting team involving Maria Toptsidou, Frank Holstein, Erik Gløersen and Kai Böhme.

ISBN: 978-2-919777-56-3

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First edition, printed in February 2014

In the same series of ESPON publications:

Territorial Observation No.1:
“Territorial Dynamics in Europe – Trends in Population Development”, November 2008

Territorial Observation No.2:
“Territorial Dynamics in Europe – Trends in Accessibility”, November 2009

Territorial Observation No.3:
“Territorial Dynamics in Europe – Trends in Economic Performance of European Regions 2000-2006”, September 2010

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“Territorial Dynamics in Europe – Natural Hazards and Climate Change in European Regions, May 2013

Territorial Observation No. 8:
“Territorial Dynamics in Europe – Regions Integrating Land and Sea”, August 2013

Territorial Observation No. 9:
“Territorial Dynamics in Europe – Gateway Functions in Cities”, December 2013

Printed on paper produced in an environmentally friendly manner.

Disclaimer:

The content of this report is based on the results of applied research projects carried out by transnational teams of researchers taking part in the ESPON 2013 Programme. As such, the maps and texts do not necessarily reflect the opinion of the ESPON Monitoring Committee.

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1 - Executive Summary

Territorial development cannot be effectively conceived, analysed or shaped by policy making without considering the broader European perspective. In this broader perspective the EU Member States plus Liechtenstein, Iceland, Norway and Switzerland should be viewed as an integral whole. The institutional and functional links between the countries are so tightly knit that their territorial developments cannot be seen in isolation.

To illustrate, one can easily imagine what North-South transport flows would look like in Europe if they could not run smoothly via Switzerland, or what European energy provision would look like without access to Norwegian energy resources, or how much more difficult access to the Arctic would be without the close cooperation of Iceland and Norway. Also at a regional level: What would life be like in Liechtenstein or in the cross-border regions of Basel, Geneva, or Østfold/Västra Götaland without the current functional integration?

Last but not least, the functional integration of the EU Member States with Liechtenstein, Iceland, Norway and Switzerland (termed the ESPON Partner States in this report) ensures that the Single European Market is larger and more powerful than it would be without them, thus increasing its benefit to all parties. On this basis the regions and cities encompassed in this European integration project can draw on complementarities and become stronger through focusing on comparative advantages.

Policy relevant key findings:

Territorial benchmarking is nourishing the understanding of Iceland, Liechtenstein, Norway and Switzerland in Europe. Key characteristics for policy makers to take into account as starting point for policy reflection and

further cooperation between Partner States and EU Member States can be listed as follows:

- The Partner States perform better in relation to the smart growth objective than most EU Member States.
- In terms of sustainable growth, Partner States generate considerable amounts of hydroelectric power, three countries (Liechtenstein, Norway and Switzerland) have lower green-house gas emissions per GDP unit than any EU Member State, and two (Iceland and Norway) have a high share of renewable energy.
- Concerning inclusive growth, Partner States have a wealth of highly educated people who can contribute directly to the shift to a knowledge-based economy. In addition, there are less people at risk of poverty in the Partner States than in most other European countries.
- Partner States display in general high population growth but have very different population densities. Two countries (Switzerland and Liechtenstein) show positive population development due to in-migration.
- Transport systems are generally well developed. Switzerland and Liechtenstein have a particularly high motorway density, which results in a high level of road accessibility.
- Switzerland has a particular position concerning rail transport as many transit routes cross the country and there are good links to many major European cities. In Norway the main railway hub is Oslo.
- While important global and European air traffic gateways concentrate in the core of Europe, Zurich, Oslo and Reykjavik show good prospects as hubs in the air transport network.
- Iceland and Norway are important sea gateways to the Arctic, while the challenge for Switzerland and Liechtenstein is to minimise travel costs to nearest sea ports.

- Concerning the role of cities, Zurich and Oslo have important roles to play in business networks,
- Switzerland and Liechtenstein are strong players in knowledge networking in the core of Europe, while Reykjavik, Akureyri, Oslo, Trondheim and Bergen form university hubs in the north.
- The Alps play an important role as tourist attraction for international and European tourism, while Norway and Iceland are appealing for nature tourism in high numbers in relation to the local population.
- Sparsely populated regions in Norway and Iceland are the type of regions mostly challenged by out-migration.
- Mountain areas in Partner States are in general impacted by and economically vulnerable to climate change.
- In spite of problems with public service provision, islands dispose of potential in the form of unspoiled landscapes and rich ecosystems.
- Islands and coastal areas of Norway and Iceland are exposed to sea level rise, storms and flooding and the North Sea is a hotspot for wind energy.
- In terms of cooperation culture Partner States are active in Interreg programmes, and particularly Norway is cooperating actively in many programmes.
- The regions of Partner States participate only at an average level of intensity in Interreg programmes, compared with regions of EU Member States.
- In particular cross-border cooperation is hampered by differences in administration and legal systems, whereas transport and fare pricing policies seem to stimulate cooperation across borders.

More details on the benchmarking and key characteristics, as well as basic facts and figures about the ESPON Partner States can be found in the chapters of the report.

In the European powerhouse. Liechtenstein, Iceland, Norway and Switzerland belong to the Centre-North powerhouse of Europe. Accordingly they are strong in many aspects of smart, sustainable and inclusive growth. In terms of smart growth, they are wealthier, on average, than the EU Member States, and can boast high levels of innovation and R&D. Looking at sustainable growth, their mountainous character provides potential for renewable energy. At the same time, Norway and Iceland have relatively high greenhouse gas emissions, mainly due to the nature of their industrial activities. As for inclusive growth, the ESPON Partner States perform well and it seems that large parts of their societies benefit from growth and investments. Furthermore, high levels of immigration and cross-border commuters are also important in this respect.

Smart, sustainable & inclusive. Although the four countries seem to be rather similar as regards this smart, sustainable and inclusive growth perspective, considerable differences nevertheless exist in respect of territorial development between them, particularly in terms of their population and economic growth characteristics. Although all four display positive population developments at the national level, there are regions within them which are, in some places, currently experiencing both, rapid demographic polarisation and ageing. Some rural and remote parts of Iceland and Norway are in this respect similar to the isolated mountain communities of Switzerland. It should however be noted that within these countries the so-called mountainous areas are rather heterogenous.

Urban strong points. The current economic strength of the Centre-North of Europe in the global competition is closely related to urban areas and cities. In particular metropolitan areas and capital cities are points of attraction for investment, providing the highest concentration of

factors of growth and job creation. This gives cities like Reykjavik, Vaduz, Oslo, Bergen, Geneva, Zurich and Basel a particularly favourable position, which also goes for other larger cities in the Partner States.

Diverse territorial concentration trends. Europe faces a general trend of territorial concentration to cities above 100.000 inhabitants. In Iceland this results in a fostering of Reykjavik's dominant position in the urban system. Norway and Switzerland experience more modest tendencies of population concentration. These concentration trends underpin the importance of secondary cities for the national economies and for the overall competitiveness of Europe. However, the urban system of the Partner States is diverse giving in particular Norway and Switzerland an advantage.

Integrated transport systems. European transport policies have a direct impact on the ESPON Partner States. For Switzerland, one of the key issues is transit traffic. As part of the so-called Zurich process, the European Commission, Switzerland and its neighbouring countries have discussed alternatives to road transport and improved road safety. For Norway and Iceland, it is important to preserve the ability to subsidise air and sea connections to remote and sparsely populated local communities. Clearly such concerns also have a broader impact on the development of cities and regions, as for example can be seen with reference to the Upper-Rhine or the Alpine-Rhine regions. Both of them undoubtedly profit from the smooth integration of transport networks and institutional arrangements. Nevertheless, there remains scope for improvement in terms of the further reduction of cross-border barriers.

Benefitting from each other's gateways. The better integrated the territories are the more their citizens and

enterprises potentially benefit from access to important gateways in other countries - both EU Member States and Partner States alike. In the ESPON Partner States this could e.g. be the transport gateways Zurich and Reykjavik but also Basel, Geneva and Oslo, the business centres of Zurich, Vaduz and Oslo or the research hubs of Zurich, Bern, Geneva, Lausanne, Trondheim, Bergen, Oslo, Reykjavik and Akureyri.

Energy export. As a major exporter of oil, gas and hydroelectricity to the EU, Norway has a particular interest in European energy policy, the functioning of the European energy market and energy infrastructure investments. Iceland also envisages becoming integrated into the European energy market through the construction of a marine cable transporting Icelandic geothermal and hydraulic electricity to the coast of North West Europe, while Swiss water reservoirs could be used more actively for the storage of electrically transmitted energy from neighbouring EU countries. At the same time, both Iceland and Switzerland remain highly dependent on energy imports, which is why their integration into the EU energy market remains an important policy goal in each country.

The special cases of agriculture and fisheries. Because of their mountainous nature and climatic constraints, the agricultural sectors in the partner countries generally face some cost difficulties in terms of global and European competition. Agriculture is however viewed as being strategically important particularly in relation to the need to guarantee a stable food supply, preserve traditional landscapes and to allow for balanced rural development. The fisheries sector is of key economic importance in both Iceland and Norway with the EU as the most important export market. The EEA agreement has not led to toll-free access to this market, but is nonetheless one of the

key factors in the rapid growth of the Norwegian seafood industry in recent years.

Fiscal policy challenge. The ESPON Partner States assert their fiscal freedom in relations with the EU, *inter alia* as an instrument for increased Territorial Cohesion. For example, the Norwegian system of differentiated labour taxation, allowing companies in remote parts of the country to benefit from lower labour taxes is an important component of Norwegian regional policy. Within the regional state aid rules adapted for the period 2014-2020 it will be possible to continue with such differentiated taxation in sparsely populated areas. The Norwegian authorities consider this to be a measure which is well suited to the promotion of economic development in these remote and sparsely populated parts of the country. In federal Switzerland, a system of so-called “tax competition” between the cantons exists, in which individuals and businesses tend to choose their location depending on the quality of public services and levels of taxation. This creates, in a European context, a unique dynamic in the relations between neighbouring territories. This system is also considered to contribute to limiting the overall level of taxation and the creation of tax systems that are adapted to individual regional contexts. Some of these cantonal tax arrangements have however been viewed as unauthorised state aid by the European Commission, which claims that they distort competition.

Key territorial cooperation themes for Partner States and EU Member States. Based on these and other territorial development characteristics a number of key themes in relation to the deepening of territorial cooperation between the ESPON Partner States and the European Union can be identified:

- **Cross-border polycentric functional regions.** Cross-border integration and cooperation is of particular relevance for Switzerland and Liechtenstein due to the volume of commuting flows through and adjacent to these countries. Measures favouring more coordinated transport infrastructure investments and integrated cross-border development strategies are thus of direct relevance to those areas adjacent to the EU border which, given their size includes much of Switzerland and all of Liechtenstein.
- **Transport policies.** Further dialogue on the topic of transit traffic across Switzerland is required which deals with the issue of access while enabling Switzerland to pursue its constitutionally enacted objective of protecting the alpine region from the negative side-effects of high-volume road usage. Efficient and reliable Swiss transit connections are needed for the economic development of a number of European regions. The dialogue on how this could be combined with a modal shift from road to rail would be enriched by incorporating a wider territorial perspective.
- **Maritime policies.** Norway and Iceland stand out due to the relative importance of the maritime sectors in their economies and to the essentially coastal nature of their settlement patterns. Maritime spatial planning is a promising policy field, and debates on these issues need to be informed by evidence detailing the importance of the sea for economic development, on specific planning challenges in coastal areas and on the perspectives for further transnational integration and cooperation. Options for Arctic maritime trade routes add a new perspective in this respect.
- **Energy policies.** Addressing foreseeable challenges in energy provision throughout Europe also requires

transnational cooperation. The Partner States are particularly important in this regard with extensive renewable energy production and, in the case of Norway, exports of fossil energy. The combined objective of reducing climate-changing greenhouse gas emissions and improving resilience in the face of increasing energy prices need to be addressed at a broad transnational level, incorporating Europe and its neighbourhood.

These themes offer the most salient opportunities for deepening the cooperation between EU Member States and Liechtenstein, Iceland, Norway and Switzerland and between the cities and regions in these 32 countries. Viewing territorial development in an integrated way between these territories helps to better exploit development potentials and to deal more robustly with emerging development challenges. Cooperation is often the key to benefiting from integration and this is also the case when it comes to territorial development e.g. within the Baltic Sea Region or the Alpine Region.

For Liechtenstein, Iceland, Norway and Switzerland, as well as for the 28 EU Member States, participation in ESPON is important in order to maintain the dialogue and establish coherent territorial evidence on structures, developments and trends at European level that can inform further cooperation and policy development.

1 - Executive Summary

Facts and figures about the ESPON Partner States

The table below places the performance of Iceland, Liechtenstein, Norway, and Switzerland – the four ESPON Partner States – in a broader EU context with regard to the key dimensions of smart, sustainable and inclusive growth. All data used is from Eurostat completed with some data provided by Liechtenstein. In the first column the year of the data is given. The most recent data available was used throughout.

	Partner States
Total territory: 2012 in Square kilometres	Iceland: 103,000.0 Liechtenstein: 160.5 Norway: 323,787.0 Switzerland: 41,284.6 EU28: 4,381,376
GDP per capita 2012 PPPs EU28 = 100	(range: high Luxembourg 272 – low Bulgaria 47) Iceland: 113 Liechtenstein: ¹ NA Norway: 196 Switzerland: 160 EU28 = 100
Total population 2012	(range: high Germany 81,843,743 – low Liechtenstein) Iceland: 319,575 Liechtenstein: 36,475 Norway: 4,985,870 Switzerland: 7,954,662 EU28: 506,820,764
Population development (2002-2013 in ‰)	(range: high Cyprus 22.7 – low Lithuania -13.9) Iceland: 10.61 Liechtenstein: 8.60 Norway: 10.07 Switzerland: 9.36 EU28: 3.02

	Partner States
Old age dependency (Percentage of persons aged 65 and older per persons aged 15-64 2012)	(range: high Germany 20.6 – low Ireland 11.9) Iceland: 12.6 Liechtenstein: 14.4 Norway: 15.4 Switzerland: 17.2 EU28: 17.8
Population density: 2011 inhabitants per km ²	(range: high Malta 1318.6 – low Iceland 3.2) Iceland: 3.2 Liechtenstein: 232.5 Norway: 16.2 Switzerland: 197.8 EU27: 116.61
Smart Growth	
Percentage of the population aged 20-64 that is employed (target 75%) 2012	(range: high Switzerland – low Greece (55.3) Iceland: 81.8 Liechtenstein: 74.0 Norway: 79.9 Switzerland: 82.0 EU28: 68.4
Percentage of GDP invested in R&D (target 3%) 2008	(range: high Sweden and Finland (3.7) – low Cyprus (0.43)) Iceland: 2.65 Liechtenstein: NA Norway: ² 2.42 Switzerland: 2.87 EU28: 1.91
Sustainable Growth	
Greenhouse gas emissions in CO₂ equivalent indexed to 1990 (1990=100%) 2010	(range: high Cyprus (150.58) – low Lithuania (43.26)) Iceland: 129.72 Liechtenstein: 101.1 Norway: 108.22 Switzerland: 102.24 EU28: 85.74

	Partner States
Share of renewable energy in gross final energy consumption 2011	Iceland: 85.8 Liechtenstein: 9.8 Norway: 65.0 Switzerland: 19.0 EU27: 13.0
Inclusive growth	
Percentage of early leavers from education and training by population 2012	(range: high Spain (24.9) – low Croatia 4.2)) Iceland: 20.1 Liechtenstein: 6.3 Norway: 14.8 Switzerland: 5.5 EU28: 12.7
Persons with tertiary education attainment aged 30-34 as percentage of the population 2012	(range: high Cyprus (35.0) – low Romania (13.6)) Iceland: 28.5 Liechtenstein: NA Norway: 33.0 Switzerland: 31.2 EU28: 24.4
People at risk of social exclusion as percentage of population 2011	(range: high Bulgaria (49.1) – low Iceland (13.7)) Iceland: 13.7 Liechtenstein: NA Norway: 14.6 Switzerland: 17.2 EU28: 24.3

¹ Because half the workplaces of Liechtenstein are covered by commuters from Austria and Switzerland, GDP per capita values are not comparable to those of other countries.

² This ratio has been calculated using GDP figures exclusive of income from oil and gas extraction. This income is saved in the "Government Pension Fund – Global". It is therefore not a functional part of the Norwegian economy. The limited proportion of this fund that is used is included in the GDP as state spending and through the implications of this spending in the wider economy. It is therefore more meaningful to relate Norwegian R&D spending to GDP excluding income from oil and gas extraction.

2 - Introduction

ESPON provides territorial data and analysis for policy-makers, addressing the needs of the EU Member States and Iceland, Liechtenstein, Norway and Switzerland, the so-called Partner States. In that sense, ESPON offers a unique chance for the Partner States to place and benchmark their territorial development in a European context.

Territorial development dynamics are not confined by the borders of the European Union. Interactions with the neighbourhood play a major role in this process. Within this neighbourhood, Iceland, Liechtenstein, Norway and Switzerland occupy a special place. Not only are these four countries linked to the EU by extensive free trade agreements (further described in Part 1). They are also part of the Schengen area, which mandates that they are part of the European area with no internal passport and immigration controls.

This extensive functional, institutional and regulatory integration with the European Union made it natural for these countries to join the ESPON programme as Partner States. Switzerland joined the programme in 2002, followed by Norway in 2003 and Iceland and Liechtenstein in 2007. This implies that these four countries are included in any current or future analyses of the challenges and opportunities for Europe's territorial development. It has also enabled researchers from these countries to participate in ESPON projects, exchanging know-how on relevant territorial development issues with colleagues from other European countries.

In many respects, the challenges faced by the four ESPON Partner States and by the EU Member States are similar. They are exposed to the same driving forces of economic globalisation, ageing, demographic polarisation (e.g. through migration tendencies), and

climate change. Each country's response to these processes is of course unique, but the ESPON Partner States do not constitute a separate group in comparison to the rest of Europe.

Drawing on the results of a wide range of ESPON applied research projects, this report highlights the territorial development themes challenges and opportunities that need to be addressed jointly by the Partner States and the EU Member States while, in addition, identifying the complementarities between each of these four states and the EU. The Partner States are perceived as "small and pragmatic" which could be an explanation for their generally positive development.

The results presented in this report will be discussed at the ESPON conference "Territorial Development in Europe: Potentials and Challenges for Iceland, Liechtenstein, Norway, and Switzerland – and for the European Union" taking place on 11 March 2014.

3 - Institutional links between the ESPON Partner States and the EU

Territorial development in Iceland, Liechtenstein, Norway and Switzerland is closely linked to territorial development trends in the EU. At the same time the fact that these four countries are not EU Member States but that they nevertheless enjoy particular institutional and functional links also significantly influences their territorial development.

Countries using the euro surround Liechtenstein and Switzerland. Since the 1920s, Switzerland and Liechtenstein have also formed their own customs and monetary union. Both countries have been active proponents of alpine cooperation, starting with the International Commission for the Protection of the Alps (CIPRA) founded in 1952. More recently, the Alpine Convention, which entered into force in 1995, broke new ground as a legally binding agreement for the protection of the alpine environment. In this context the European macro-regional strategy for the Baltic Sea Region and the forthcoming macro-regional strategy for the Alps should also be mentioned.

Norway and Iceland, on the other hand, are at the margins of the European territory. They both function as interfaces with the increasingly important Arctic region and are members of the Arctic Council. While Norway has developed increasingly dense commercial and diplomatic links with Russia over the past decades, Iceland has traditionally had strong links to the United States and to Canada. Norway and Iceland also cooperate extensively with the other Nordic countries in the framework of the Nordic Council, which was established in 1952. Together with the regions of Sweden and Finland that benefit from specific EU support on the basis of their low population density and remoteness, Northern Norway is part of the “Northern Sparsely Populated Areas” network which defends the

interests of these areas at the European level. Despite the fact that it faces similar challenges Iceland does not participate in this network.

In terms of foreign trade, the European Union is by far the most important exchange partner for all Partner State countries, accounting for around 60% of exports from Liechtenstein and Switzerland, and over 70% for Iceland and Norway. The share of imports from the EU is considerably higher for Liechtenstein and Switzerland (78 and 89%, respectively) than for Norway (63.5%) and Iceland (45%). In terms of merchandise trade (see Table 2); Norway’s share in EU exports is considerably lower than its share in total imports, mainly due to exports of oil and gas. However, Norwegian exports of fishery products and metals are also significant. Switzerland accounts for almost 8% of EU merchandise exports, and 5.8% of its imports, while the corresponding ratios for Iceland and Liechtenstein are in the range between 0.1 and 0.2%.

Table 1 Share of total foreign trade with the European Union

Share of total foreign trade with the European Union		
	Exports	Imports
Iceland	73.2%	44.8%
Liechtenstein	60.0%	89.4%
Norway	75.0%	63.5%
Switzerland	56.9%	78.0%

Sources: National statistical institutes. IS and NO (2012), LI and CH (2011). LI figures are calculated exclusive of trade with Switzerland

Table 2 Share of merchandise trade with the European Union

Share of total foreign trade with the European Union		
	Exports	Imports
Iceland	0.1%	0.2%
Liechtenstein	0.1%	0.1%
Norway	3.0%	5.6%
Switzerland	7.9%	5.8%

Source: European Commission, DG Trade

The institutional modes of association with the European Union also vary depending on the Partner State considered. All four states belong to the European Free Trade Association (EFTA). However, only Iceland, Liechtenstein and Norway are full members of The Single Market (agriculture and fisheries excepted) through their membership in the European Economic Area (EEA). Switzerland is economically associated to the European Union on the basis of bilateral agreements. These three different frameworks for European economic association are further described in the text box below.

It should be noted that all Partner States contribute to European Cohesion policy. As part of the EEA grants, Iceland, Liechtenstein and Norway provided 988.5 million Euro to support 86 programmes in 16 EU countries between 2009 and 2014. In the same period, Switzerland made a similar contribution of over 1 billion Euro. Additionally, through the Norway Grants, Norway provides 800 million Euro to projects in the 12 countries that joined the EU between 2004 and 2007.

3 - Institutional links between the ESPON Partner States and the EU

EFTA

EFTA is an intergovernmental organisation set up for the promotion of free trade and economic integration to benefit its Member States, established in 1960. It now has four Member States: Iceland, Liechtenstein, Norway and Switzerland. However, the EFTA convention of 1960 only applies to trade relations between Switzerland and the three other states.

Trade relations between Iceland, Liechtenstein, Norway and the EU are governed by the EEA Agreement further described below. EFTA manages this agreement. For this purpose, an EFTA court has been set up, formally known as Court of Justice of the European Free Trade Association States. This court is competent to decide on infringements on the EEA agreement.

EEA

The EEA entered into force on January 1994. The EEA agreement is concerned principally with 'the four freedoms' — the free movement of goods, services, persons and capital. However, it is important to note that agriculture and fisheries are excluded from the agreement.

In addition to market integration, the agreement covers cooperation in important areas such as research and development, education, social policy, the environment, consumer protection, tourism and culture, collectively known as 'flanking and horizontal' policies. Concretely, the agreement mandates that EU-regulations are transposed into national law in Iceland, Liechtenstein and Norway. Each country has a right of veto, but the European Union may then denounce the part of the Treaty pertaining to the concerned regulation.

Schengen Agreement illustrates the close integration between EU and ESPON Partner States. Iceland, Liechtenstein, Norway and Switzerland are associate members of Europe's border free Schengen area (see text box). To ensure the full participation of the associated states a specially designated institution, the Mixed Committee, has been established. This

Schengen

The Schengen area and cooperation are founded on the Schengen Agreement of 1985. The Schengen area represents a territory where the free movement of persons is guaranteed. The signatory states to the agreement have abolished all internal borders in lieu of a single external border. Here common rules and procedures are applied with regard to visas for short stays, asylum requests and border controls. Simultaneously, to guarantee security within the Schengen area, cooperation and coordination between police services and judicial authorities have been stepped up. Schengen cooperation has been incorporated into the European Union (EU) legal framework by the Treaty of Amsterdam of 1997. However, all countries cooperating in Schengen are not parties to the Schengen area. This is either because they do not wish to eliminate border controls or because they do not yet fulfil the required conditions for the application of the Schengen acquis. However, all ESPON Partner States are part of the Schengen area.

Committee meets in the margins of the normal council meetings on all levels. The Mixed Committee allows the four associated non-EU countries to participate at all levels of Schengen cooperation.

The abolition of border controls with Norway and Iceland was introduced in March 2001, at the same time as border controls were abolished between the Nordic EU Member States Denmark, Finland and Sweden. Switzerland and Liechtenstein joined the Schengen area in December 2008 and December 2011, respectively.

The extension of the Schengen Agreement to the ESPON Partner States has not had an obvious direct impact in terms of migratory patterns or the mobility of workers. However, the Partner States have, in line with other European countries, experienced increased migration

Switzerland's bilateral agreements

In 1992 the government of Switzerland decided not to join the EEA, based on a referendum, but they remained part of the EFTA. Switzerland instead has bilateral agreements in a range of different sectors. Herewith Switzerland has agreed to take on certain aspects of EU legislation in exchange for accessing the EU's single market. The first bilateral agreements of 1999 encompass free movement of persons, technical barriers to trade, agriculture, research, civil aviation and overland transport. The 2004 agreements are broader and deal for example with taxation of savings, education, the environment and participation in Schengen/Dublin.

and intensified cross-border commuting. The latter phenomenon is particularly important in Switzerland, as the number of Swiss-employed cross-border commuters has increased from 165,000 in 2003 to over 270,000 in 2013. During the same period, the proportion of non-Swiss workers went from 21.6% to 24.7%. In Norway, there is significant in-migration from countries that joined the European Union between 2004 and 2007. In 2012, Poland and Lithuania were the two first countries of origin of in-migrants, before Sweden.

More integration between the EU and the ESPON Partner States. Iceland is the only ESPON Partner State that has recently envisaged the possibility of EU-membership, by filing an application in 2009. Iceland started the negotiation process with the European Commission in 2010, but these negotiations have been on hold since the 2013 elections in Iceland. However, all ESPON Partner States maintain a constant dialogue with the European Union in view of maintaining strong and mutually beneficial commercial links. The policy topics and objectives that are seen as most important for the EU Member States are often also important for the four Partners States, as illustrated in chapter 7.

4 - Smart, sustainable & inclusive growth










Selected key messages:

- The ESPON Partner States are wealthier than most EU Member States, and they can generally boast high levels of performance when it comes to innovation and R&D. However, in economies where energy-intensive industries and raw material extraction play a major role such as Iceland and Norway, the comparison of R&D expenditure and GDP per capita needs to be interpreted with some care.
- Due to their mountainous character all ESPON Partner States have potentials for renewable energy and have a high share of renewables in their final consumption. On the other hand, Norway and Iceland have high greenhouse gas emissions, mainly due to the nature of their industrial activities.
- The ESPON Partner States are performing well in terms of inclusive growth, where all inhabitants can benefit from growth and investments.

4.1 Smart growth: Growth and investment characteristics

Smart growth stresses the importance of a well-educated population, research & development and innovation to promote economic growth. The ESPON Partner States have diverse economic profiles, but can be characterised as well-performing European countries. In what follows below traffic lights (with the colours red, amber and green) are used to illustrate a comparison between the ESPON Partner States and the rest of Europe. A green light indicates that the Partner State is performing better than most of the other countries in Europe for that particular target. On average the ESPON Partner States perform better than most other European countries.

Figure 1 Traffic lights Smart growth

	Median ESPON Space	Iceland	Liechtenstein	Norway	Switzerland
GDP at market prices (PPS) per inhabitant in Euro 2012	24,800.00				
Employment rate (20 to 64 years) 2012	67.65				
R&D expenditure by all sectors as share of GDP (Iceland 2011, Norway 2012, Switzerland 2008)	1.30			 ¹	

The use of traffic lights in this way allows us to easily communicate the national situation as compared to the rest of Europe. However, it does not allow for a more nuanced picture as concerns the disparities in a particular area.

The colour of the lights indicates whether the ESPON Partner State is performing better or worse than the median of the ESPON space. Interval thresholds were obtained by calculating the arithmetic mean between the median and the values of the first (Q1) and third (Q3) quartiles. These calculations defined the lower (L1) and upper limits (L2) of each interval.

A red light indicates that the ESPON Partner State is performing worse, the value of the ESPON Partner State is below L1

A yellow light means a value for the ESPON Partner State between L1 and L2.

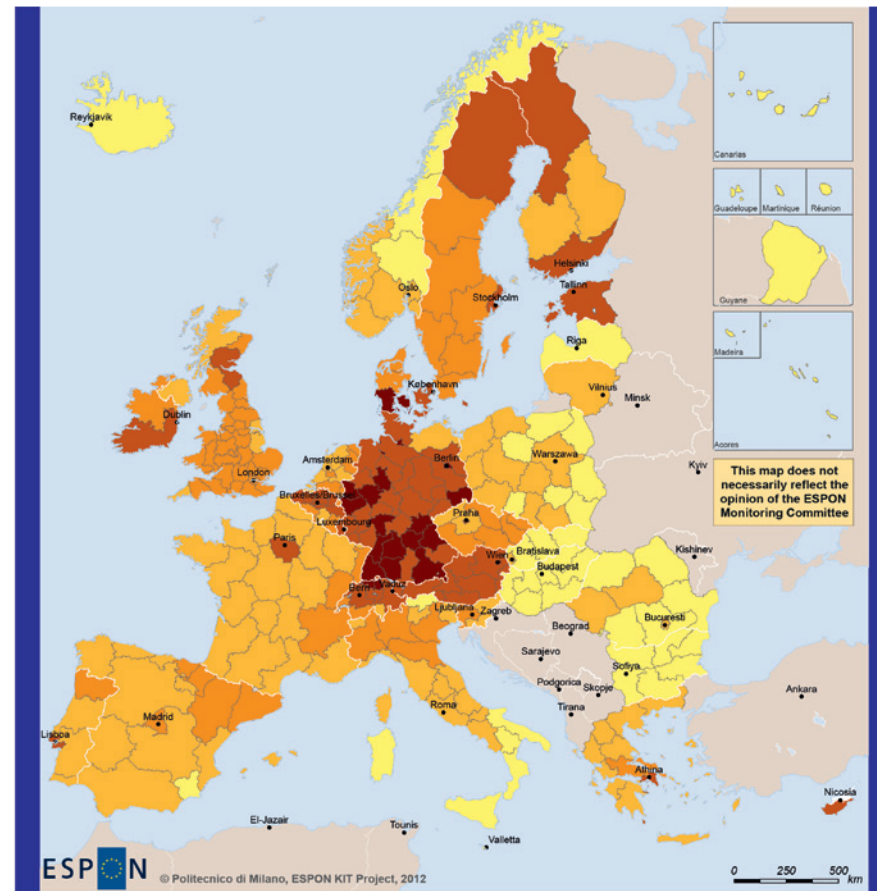
A green light indicates that the ESPON Partner State is performing better than the European median; the value of the ESPON Partner State is above L2.

¹ This ratio has been calculated using GDP figures exclusive of income from oil and gas extraction. This income is saved in the "Government Pension Fund – Global". It is therefore not a functional part of the Norwegian economy. The limited proportion of this fund that is used is included in the GDP as state spending and through the implications of this spending in the wider economy. It is therefore more meaningful to relate Norwegian R&D spending to GDP excluding income from oil and gas extraction.

The ESPON Partner States perform better in relation to the smart growth objective than most EU Member States. GDP per inhabitant in all four ESPON Partner States is higher than in most other European countries. Despite their different economic structures the four Partner countries also have many similarities. They are relatively rich, i.e. GDP per capita in Purchasing Power Standards (PPS). Nevertheless, recent developments in terms of GDP levels have differed. All four were affected by the global economic and financial crisis. Switzerland, Liechtenstein and Norway however saw only a minor decrease in GDP between 2008 and 2009, while Iceland was severely hit by the crisis. Similar trends can be observed for the employment rate. All Partner States are performing better than most EU countries. However Iceland has seen a relatively larger decline in its employment rate after 2008 than the three other Partner States. Of the top-10 regions with the highest employment rates in the EU and Partner States are five

Territorial patterns of innovation illustrate smart growth. Patterns of innovation encompass a combination of context characteristics that lie behind different modes of performance in different phases of the innovation process. The main characteristics are science-based knowledge, R&D endowment, human capital, ability to interpret and use external knowledge and creativity. This results in four types of areas where 'European science-based areas' are most knowledge- and innovation- intensive but seem to be less attractive and creative. While 'Applied science areas' have the chance to specialise in the production of applied knowledge, 'Smart technological application areas' focus on product innovation. Innovation capacity in 'Smart and creative diversification areas' is fed by external knowledge which is embedded in technical and organisational capabilities. 'Imitative innovation areas' can build on local preconditions like creativity and especially attractiveness in order to embrace new adoption, imitation and innovation strategies. This is shown in Map 1.

Map 1 Territorial patterns of innovation



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Regional level: NUTS2
 Source: ESPON KIT Project, 2012
 Origin of data: EUROSTAT, 2012
 © EuroGeographics Association for administrative boundaries

Types of innovation regions

- Imitative innovation area
- Smart and creative diversification area
- Smart technological application area
- Applied science area
- European science-based area
- No data

from Switzerland, two from Norway (Oslo and Vestlandet) and another is Iceland (whole country). The only other European regions on this list are Åland in Finland and Stockholm in Sweden.

Comparing levels of expenditure in R&D across all sectors to GDP is considered to be a good indicator of how well a country is able to adjust to the emerging knowledge economy. Additionally, it is thought that high levels of investment in R&D reflect a better capacity to adapt to changing framework conditions, to limit the impact of periodic crises and to develop a higher and more resilient economy in the long-term. Based on the European target of 3% expenditure of GDP to R&D Iceland, Switzerland and Norway perform better than most other European countries, although, unlike Sweden or Finland, none has yet reached the target of 3%.

Different types of innovation apply to the European territory. European science based and applied science areas are mainly identified in the large metropolitan areas in the centre of Europe, as for example in Germany, Switzerland, Austria and Liechtenstein, as well as in northern Europe, e.g. in northern Sweden and Finland, in southern Finland and in Estonia. Areas focusing on smart and creative diversification as well as smart technological application areas can be identified all over the European territory, covering the largest area of the map, while imitative innovation areas are mainly to be found in the eastern part of Europe. Located in the European core, most of Switzerland and Liechtenstein's areas are characterised as “science based and applied science”, with some areas in southern Switzerland characterised as smart and creative diversification and smart technological application areas. On the other hand, Norway and Iceland have regions which focus on “smart and diversified innovation” and “imitative

innovation”. Thus human capital is an influential factor for Norway and Switzerland. Indeed, urban nodes such as Zurich rank highly due to the concentration of scientists and technology experts.

4.2 Sustainable growth: Limiting the negative environmental impact of growth

Liechtenstein, Switzerland and Norway have lower greenhouse gas emissions per GDP unit than any EU Member State. From the Partner States, only Iceland has emissions above the European median value. The high Icelandic emissions mainly come from transport and from industrial process emissions. There has been a sharp increase in emissions since 1990 due to fact that new aluminium smelters have been established. Norway and Iceland each host energy intensive industries such as those relating to bauxite and aluminium, the chemical industry (fertilizer production) and wood processing (wood pulp). Additionally, oil and gas extraction activities in Norway are a major source of greenhouse gas emissions. Moreover, the shift from oil to gas as the main resource being exploited, and the exploitation of new, less accessible fields increases the level of CO₂ emissions.

Iceland and Norway have a relatively high share of renewable energy in their final energy consumption totals. This is despite the fact that they have recorded relatively high greenhouse gas emissions since 1990 and the dominant presence of the oil-related industry in Norway. Indeed, the share of renewable energy in the final energy totals in Norway and Iceland is considerably higher than in most EU Member States, reaching 85.8% and 65.0% in 2011 respectively. Switzerland also has a relatively high share (19%), and thus also

almost reached the 20% EU target in the same year. However, Liechtenstein stands out with a share of only 9.8% in 2011 although this share has increased from 6.2% in 1990. The national energy strategy adopted by the Liechtenstein government in 2012 sets a target of 20% to be reached in 2020, in line with the Europe 2020 target.

All ESPON Partner States generate a considerable amount of hydroelectric power production, due to their mountainous nature. Liechtenstein's energy strategy estimates that they have an unused hydroelectric power potential that exceeds total current production levels, which accounts for 19% of their total electricity consumption. However, in most ESPON Partner States, there is considerable opposition to further large-scale development of hydroelectric power production. The focus is rather on improving the efficiency of existing plants and on developing selected forms of small-scale energy production. Finally, there is now also increasing awareness of the potential use of water reservoirs for the storage of energy from other sources. The pumped-storage hydroelectricity plants being built in Linth–Limmern and Poschiavo in Switzerland have for example a combined total capacity of almost 2,500 MW, enough to provide over 200,000 households with electricity. Energy from pumped-storage hydroelectricity plants is however often rather expensive compared to imported energy from neighbouring countries.

4.3 Inclusive growth: Drawing on all parts of society

Inclusive growth focuses on reaching a high level of participation in the labour market, on helping people to manage change through investment in skills & training and on ensuring that the benefits of growth reach all

parts of the EU and all social groups. The convergence of certain socio-economic indicators between regions can therefore function as a useful component in respect of this objective.

The ESPON Partner States have a wealth of highly educated people who can contribute directly to the shift to a knowledge-based economy. The ESPON Partner States have, in relative terms, more persons with a higher education than most other European countries. Two Norwegian regions (Oslo og Akershus and Trondelag) rank in the top of regions with the highest percentage of 30-34 year olds with a tertiary education. On the other hand, Norway and Iceland also have higher rates for early school leavers; in this respect, they are performing worse than most of the EU Member States. By comparison, Switzerland has one of the lowest dropout rates in Europe. This field of action is all the more important considering that all other indicators of inclusive development, including the previously described employment rates, reflect high levels of performance. The reasons why such high level of performance are possible despite the dropout rates may also need to be reflected upon, as this could indicate a higher demand for employees without a completed secondary education than suggested by the Europe 2020 objectives.

In ESPON Partner States less people are at risk of poverty than in most other European countries. The values for Iceland and Norway are lower than for any other European country in the ESPON space. The Swiss rate is also significantly lower than the European median value.










Figure 2 Traffic lights Sustainable growth

	Median ESPON Space	Iceland	Liechtenstein	Norway	Switzerland
Emissions (in CO ₂ equivalent) indexed to 1990 (1990=100%)	● 93.42				
Share of renewable energy in gross final energy consumption 2011	● 11.55				
Greenhouse gas emissions (in tons of CO ₂ equivalents) per GDP unit 2011	● 0.38				

The use of traffic lights in this way allows us to easily communicate the national situation as compared to the rest of Europe. A full description of the traffic lights is given under the traffic lights for Smart Growth.

The aims of smart, sustainable and inclusive growth are also pursued through cooperation and common actions. These actions are not only however pursued within the EU as a broader approach to cooperation has also been developed in which the ESPON Partner States play an active role. The aforementioned objectives have also been integrated into their national policies. Even if they can boast a very good position in most respects, coordinated actions with EU Member States are considered to be mutually beneficial, especially in some fields such as transport, innovation or renewable energy resources. Within these fields, a mutual exchange of experiences with the EU Member States can contribute to the creation of a more balanced territory across Europe. The focus of the report is therefore on these aspects.

Figure 3 Traffic lights inclusive growth

	Median ESPON Space	Iceland	Liechtenstein	Norway	Switzerland
Percentage of early leavers (aged 18-24) from education and training by population 2012	● 10.60				
Persons with tertiary education attainment aged 30-34 as percentage of the population 2012	● 38.15				
People at risk of poverty as percentage of population 2011	● 24.50				

The use of traffic lights in this way allows us to easily communicate the national situation as compared to the rest of Europe. A full description of the traffic lights is given under the traffic lights for Smart Growth.

5 - Selected territorial development features

Selected key messages:

- In general, ESPON Partner States show positive population developments, however there are regions which experience rapid demographic polarisation and ageing in some parts. Rural and remote parts of Iceland and Norway are in this respect similar to isolated mountain communities of Switzerland.
- Concentration trends towards the main urban centres are particularly strong in Iceland, and comparably modest – albeit present – in Norway and Switzerland.

For a long time thinking about competitiveness and cohesion was shaped by the idea of a strong, high-performing European core and a territorially diverse European periphery with different development challenges to overcome. This binary model is no longer appropriate. In Europe, there are north-south divides, and west-east divides. Convergence regions in the west that were doing well during the boom years have been severely hit by the crisis, while some eastern regions appear to be further along the road to recovery.

Capital cities remain strong and attract young, skilled people, but some secondary cities risk losing gains they had made before the crisis. Accessible rural regions have to cope with some of the negative features of growth, while many remote regions struggle with a shrinking and ageing population. There are affluent mountainous areas, but cities within the core are striving to avoid decline. Places everywhere have to adapt to climate change, but some are doing better than others. Energy security looms as a continental threat, but there are areas with exceptional potential for renewable energy development.

5.1 Territorial concentration tendencies

Clear tendencies exist towards territorial concentration in Europe. These are most evident in terms of demographic change and economic wealth, which then shape the trajectory for other forms of development. The centre-north comprises the core of Europe, but also the Nordic countries, which hitherto had not been included in conventional definitions of the core as the area between London, Paris, Milan, Munich and Hamburg, the so-called Pentagon. This centre-north part of Europe tends to be wealthier than most of the rest of Europe. There are also differences in education, R&D, the provision of services of general interest, infrastructure, and environmental conditions. Broadly speaking, this area of Europe – shifted somewhat to the east – has lower levels of exposure to climate change impacts, better adaptive capacity and hence less vulnerability than the southern parts of Europe.

Metropolitan areas are the points of attraction.

Attractive and wealthy cities and urban regions currently draw people and economic activity towards them, with the core and northern parts of Europe being particularly strong. Cities, which are now increasingly functionally integrated with their hinterlands, are crucial to Europe's competitiveness globally. Indeed, Europe's biggest cities are its main gateways to the world. They are transport hubs and nodes in the global financial system as well as incubators for world-class research and innovation networks. The importance of these global metropolitan areas for the European economy is unquestionable, although the competitive advantages of agglomerations have limits.

Second tier cities matter. While the discussion about global gateway cities suggests some form of hierarchical urban system, analysis of a wider range of European cities reveals the existence of a number of complex roles and networks. In general, capital cities have a dominant role in the economy. However, second-tier cities and the territorial decentralisation of investments can boost national economic performance and with it Europe's overall competitiveness.

Agglomerations also face challenges. Cities are also places where environmental and social challenges are at their most intense. Agglomeration costs, such as congestion, are increasingly perceived as a counterbalancing disadvantage for businesses and residents. Territorial development and globalisation are about more than centrality. Even smaller places can now be very well connected within the global economy, e.g. through e-commerce or specialised products.

The urban endowment of the Partner States is diverse

Concentration in Reykjavik in Iceland. The capital region dominates the urban system of Iceland and to a lesser extent of Norway also. In Switzerland, Zürich is markedly larger than all other urban regions with its 1.8 million inhabitants, though a rather balanced system of four secondary cities (400 to 560,000 inh.) and 13 third tier cities (100 to 400,000 inh.) exists. The long-term dynamics of these urban systems are illustrated in Figure 4, which also includes some other ESPON countries as points of comparison. This figure is based on a simplified estimation of urban polarisation trends, as it considers current urban boundaries only. In other words, the extension of urban areas through

5 - Selected territorial development features

improved infrastructures and higher individual mobility is not taken into account. The figure nonetheless reveals significant differences between the countries with regards to the percentage point difference between the share of population living within the different types of urban and rural areas in 1961 and in 2011. Iceland stands out with a remarkable shift of over 15 percentage points between the two dates, respectively reflecting the increase in the share of the population in the Reykjavik region and the decrease of the overall share in the rest of the country. Similar figures can only be observed in Finland. However, contrary to Iceland, Finland also has a network of medium-sized towns between 100,000 and 400,000 inhabitants that have concentrated a significant proportion of the population growth.

Modest urban concentration tendencies in Norway and Switzerland. The relative population decrease in Norway's municipalities outside of urban regions of more than 100,000 inhabitants is only about half of that in Iceland and Finland. It is comparable to the figure for Sweden. However, this group includes a wide diversity of areas, and Norway has experienced more limited population decline in rural areas and small towns than Sweden. In Norway, the increase in the share of population of towns between 100,000 and 400,000 inhabitants is, moreover, larger than that of the capital region, while the population concentration concerns the capital region (+5.5 points) and Malmö and Gothenburg (+3.4 points) in Sweden.

Switzerland has experienced much more modest transfers of population, with an increase in the share of Zürich region of only about 1.5 points. This value is, perhaps surprisingly, almost twice that of Paris in France for the same period. However, if one excludes the Zurich area, the highest increase in the share of

Figure 4 Percentage point difference between share of population living in current functional urban areas (FUA) of different sizes and rural areas in 1961 and 2011



Notes: Percentage values calculated on the basis of current FUA boundaries Threshold values based on 2011 population values FUA of Reykjavik identified as areas with postal codes starting with 1 and 2, plus Akranes and Hvalfjarðarsveit.

Source: Spatial Foresight, based on data from national statistical institutes

5 - Selected territorial development features

the total population is observed in the 13 third tier cities with between 100,000 and 400,000 inhabitants. The dynamism of these cities has therefore helped in upholding the Swiss federal ambition of polycentric urban development. One reason for this is the existence of good transport networks.

5.2 Demographic and labour market characteristics

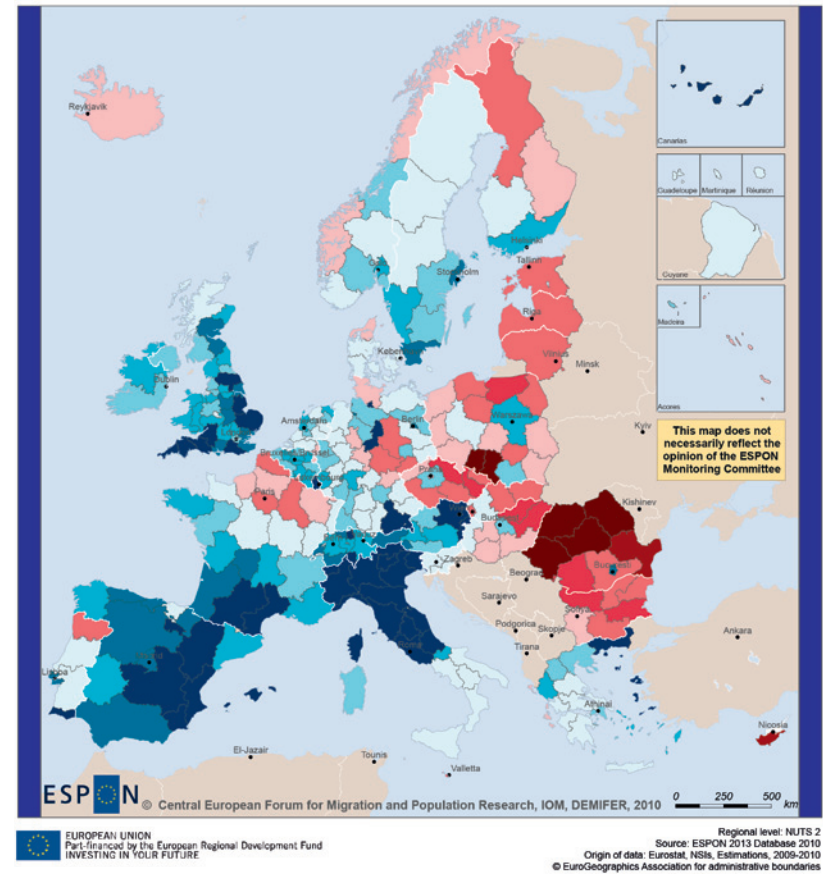
High population growth in the ESPON Partner States.

As illustrated by the facts and figures table, the ESPON Partner States experience high population growth compared to the European average value. The only European countries with a higher population growth than the Partner States between 2002 and 2013 were Cyprus, Luxembourg, Ireland and Spain.

Trends within the period have however been somewhat differentiated depending on the country considered. In Norway and Switzerland, population growth accelerated, from around 7‰ per year at the beginning of the period to around 12 to 13‰ between 2008 and 2013 in Norway, and to slightly under 11‰ in Switzerland. In Liechtenstein, population growth varied between 12.7% and 5.3%, with the lowest values towards the middle of the period. In Iceland, population growth was over 20‰ between 2006 and 2008, but then fell sharply in the aftermath of the financial crisis. By comparison, population growth was relatively more stable during the period in Liechtenstein.

The Partner States have very different population densities. Iceland's population density is, by far, the lowest in Europe with 3.2 inh/km². Norway's population density of 16.2 inh/km² is also considerably lower than the EU average (116.6 inh/km²). Switzerland's population

Map 2 Impact of migration on population in 2050



Impact of Migration on Population in 2050, Difference in Population in %

-60.0 – -40.0	(7)
-40.0 – -30.0	(2)
-30.0 – -20.0	(8)
-20.0 – -10.0	(26)
-10.0 – 0.0	(28)
0.0 – 10.0	(63)
10.0 – 20.0	(43)
20.0 – 30.0	(44)
30.0 – 40.0	(24)
40.0 – 107.0	(44)

Impact of migration on population in 2050, calculated as the difference in population between the *Status Quo and No Migration* scenarios in % of the population in the *No Migration scenario*

5 - Selected territorial development features

density is higher than the EU average. However, in all these countries, the national average value hides considerable differences between urbanised lowlands and more sparsely populated mountainous areas and, in the case of Iceland and Norway, peripheral regions. Liechtenstein's high population density has a different meaning and implications, considering the limited extent of its territory.

In terms of employment rates, not only do all Partner States have higher values than the EU average, their values are also higher than any of those observed in European countries, taking into account the fact that only employment rates for the population aged 15-64 years are available for Liechtenstein. Switzerland has particularly high male employment rates, while Icelandic and Norwegian values for the female population stand out.

Map 2 shows the likely impact of migration on population in the future, based on a comparison of two scenarios. It is relevant to consider migration patterns for future population forecasts and the impact of various migration streams, i.e.:

- extra-European migration,
- international migration within Europe and
- internal migration, within European countries.

A change in population or different patterns of population flows also has an impact on territories. Some regions may be more sensitive to demographic challenges like ageing or economic decline. For the affected regions such challenges can result in declining local tax revenues and a thus in the reduction of the region's service level due to the current level being economically unsustainable. On the other hand, such

changes may also present regions with the potential for positive development as new paths are taken.

Switzerland and Liechtenstein show positive population development due to migration. The four ESPON Partner States highlight different processes of population change in relation to migration. Switzerland and Liechtenstein gain, with the region of Valais being one of the European regions that can expect the most significant population increase due to migration, according to the scenarios. The ESPON scenarios foresee more nuanced trends in Norway, with positive migration figures around the Oslo fjord and Trondheim, while negative figures emerge for other regions. The projected negative net-migration in Iceland is contradicted by forecasts coming from the Iceland statistics where even their most negative scenario foresees a slightly positive net migration rate¹.

Switzerland and Norway will experience rather unbalanced demographic trends, with strong growth in central areas and more or less intense decline in peripheral and/or rural parts. In addition, Oslo is expected to see a decrease in its share of the country's ageing population, whereas the opposite is true for many other regions. The patterns are similar for the rest of Europe, which shows an east-west and urban-rural development in terms of population impacted by migration. A negative impact on population due to migration, as in Iceland and in peripheral regions more generally, represents a challenge that needs to be taken into consideration from an early stage. It can, for instance, influence the growth and investment ambitions of the affected regions.

¹ Statistics Iceland (2013) Population projection 2013-2060, Statistical Series 2013:2, 22. august 2013.

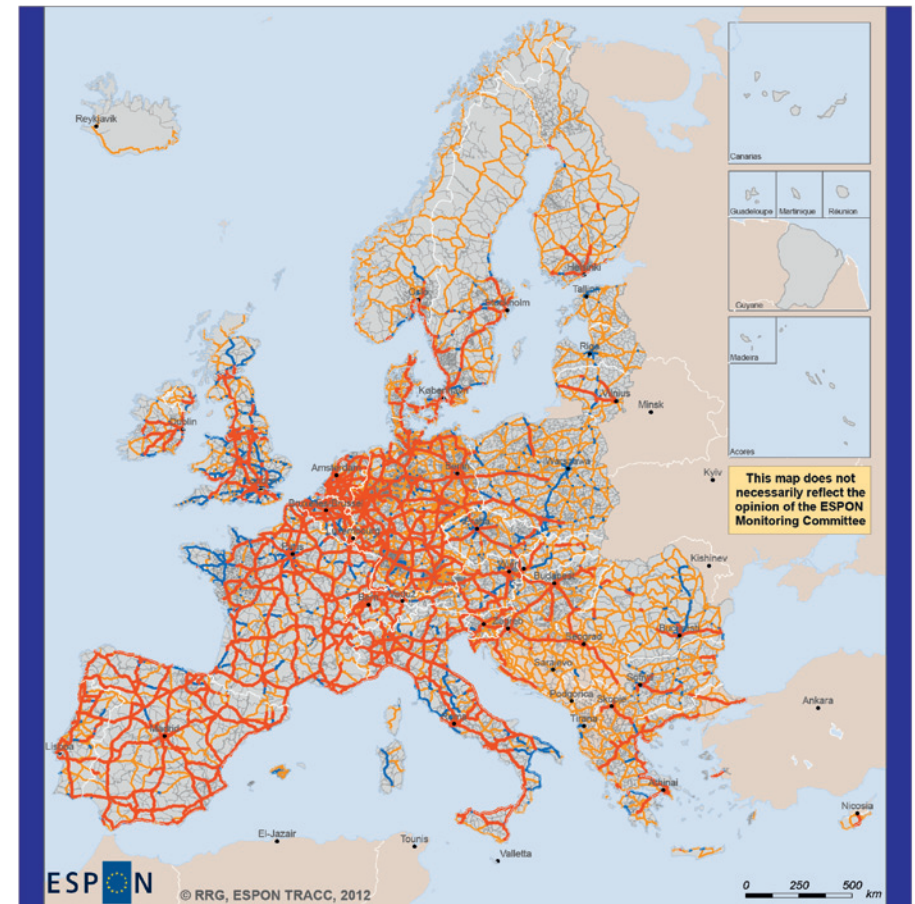
6 - Transport corridors and the flow of goods, people and information

Selected key messages:

- Liechtenstein and Switzerland, positioned in the centre of Europe, dispose of a high density of road and rail lanes, enabling the flow of goods and people across Europe.
- Norway and Iceland, investing in their comparative advantage of having extensive coastal areas, as well as on their good air accessibility, do function as important hubs for European sea trade and international flight connections.
- Transport is a key component of everyday life, which is clearly depicted in the Upper Rhine commuting example. This reflects the relationship between a Partner State and neighbouring EU members, showing that transport corridors influence everyday life.
- Trade is a core reason for better transport connections in terms of the trade chains. Therefore connections through shipping lanes are important not only for Norway and Iceland, but also for Switzerland and Liechtenstein, in order to facilitate import and export activities.

Transport as a core link between countries. Transport plays an important role in terms of cooperation and trade. Looking more closely both at the European policy framework and the existing transport networks across Europe shows how well integrated transport systems in Europe actually are. Road, rail, ports and air connections enable the flows of goods and people in, out and across Europe. The intensity of these flows points to the existence of some existing or potential gateways.

Map 3 European wide road network



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RRG GIS Database, RRG 2012
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European-wide road network (for European accessibility analyses)

- Motorway
- Express roads
- Trunk roads
- Other roads (non-modelling network)

6.1 Road connections

Motorways, express roads and trunk roads comprise the overall European road network. Map 3 illustrates the road network database in Europe, which mainly depends on accessibility indicators. In this respect, trunk roads are important, since they usually connect two or more cities, ports, airports etc., and are recommended for long distance and freight traffic. The geographic position and the morphological characteristics certainly play an important role in the infrastructure of transport corridors.

Motorway and trunk roads show a high density in North West Europe. Regions in northwest Europe show a high density of road connections and networks, these regions are generally located in Germany, France, the Netherlands and Belgium, as well as in most regions of the UK. A lower density level is to be observed in the eastern part of the European territory with a lesser level again in the extreme North. Trunk roads are also to be found in the north, west and in central Europe.

Express roads dominate in the southwest and north west of Europe. The western part of Europe is characterised by express road connections, with characteristic examples being the regions of Spain, the UK and also western France. On the other hand, and to a lesser extent, there are express roads in the regions of Eastern

Europe, as well as Italy and some parts of Greece, Romania and Bulgaria.

Motorways and trunk roads define the high level of accessibility in the Partner States. Despite the dense European road network, map 3 also shows that the Partner States are particularly well integrated. The road network in Iceland is mainly characterised by a circular trunk road, which connects most towns along the coast with the Reykjavik urban area. In Norway, the trunk road network is composed of a radial system, which connects the cities of the south to the capital and a network running all along the coast from the south-eastern border to Sweden to the northern border with Russia. In addition, there are a number of transversal cross-border links such as E14 from Trondheim to Östersund and Sundsvall in Sweden, and the E8 from Tromsø to Haparanda-Tornio and Kemi in Finland. These networks create a number of opportunities for interaction. The proximity of the northernmost regions to Murmansk also has an increasing influence on development in this area. Similarly, in spite of the long distances highlighted by the ESPON TRACC project, significant interactions nevertheless exist between the urban centres of the far North. Further developing these interactions across national boundaries is one of the main development perspectives for the region.

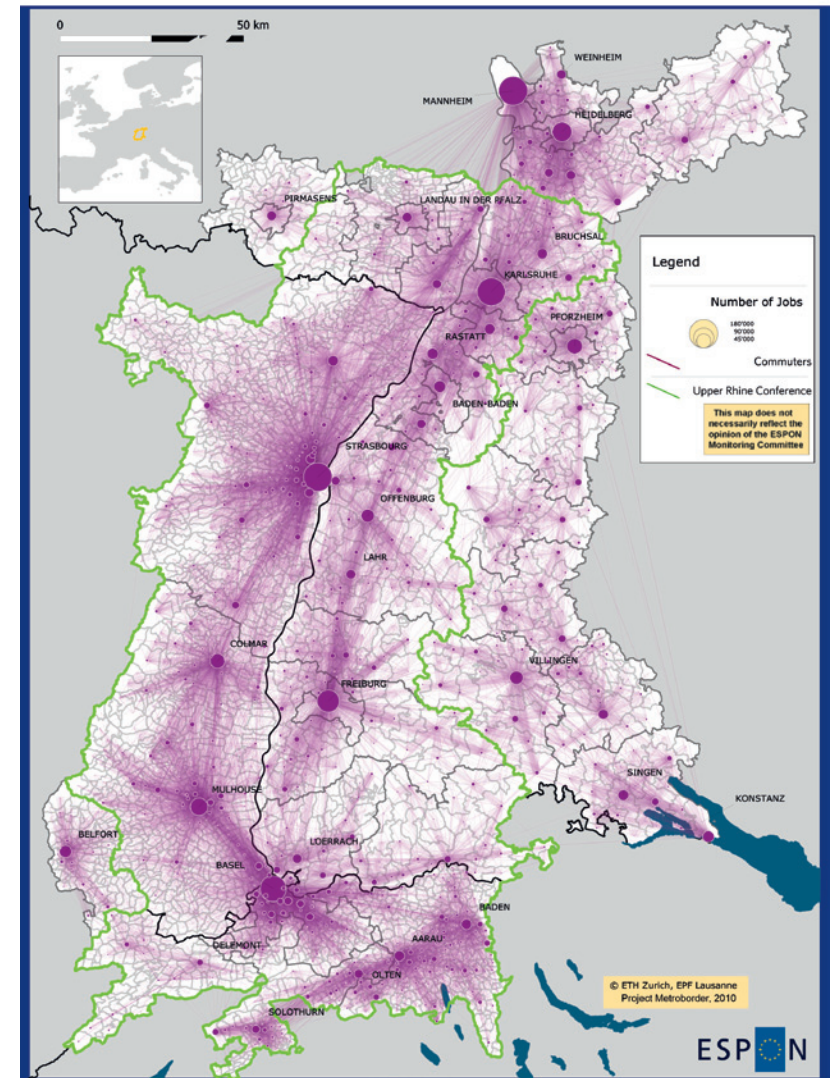
High motorway density in Switzerland and Liechtenstein. Improving external and internal transport connectivity has been a long-term goal for both Switzerland and Liechtenstein for many years. Positioned in the core of Europe they demonstrate a high density in all three road transport hubs, which not only improves connections with neighbouring countries but also facilitates the internal transport of goods and people. Switzerland has a dense and high quality transport network, ensuring high urban connectivity with rather low travel times, despite its rather difficult topographical situation straddling the Alps. Core cities such as Geneva, Zurich Bern and Basel are thus very well connected to each other, as well as to close neighbouring cities across the border, such as, Milan, Lyon, Stuttgart and Mulhouse respectively. Liechtenstein is well-connected to Zurich to the west and to Munich and Innsbruck to the east. Investing in infrastructure, the Partner States managed to establish strong transport links, which ease not only the flows of people, but also the flows of goods, thus playing an important role in the trade relations. In consequence, the above-mentioned cities should be viewed as European and regional transport gateways connecting several parts of the Central European region.

The case of commuter flows in the Upper-Rhine Region

Transport is not only crucial for long distance trips and trade functions. It also has an impact on people's everyday lives when daily commuting is necessary to reach their places of work. This is the case for the Upper Rhine region, where a high commuting density is one of the indicators of regional flows. Map 4 shows the transport connections with the neighbouring cities in the Upper Rhine, and their commuting activity, reflecting the fact that it is a transport and business regional gateway.

Map 4 underlines that commuting is primarily a domestic phenomenon that is being complemented by cross border commuting. The latter may also be seen as a cross border integration process, which has a positive effect in terms of dynamic labour markets. Basel, for example, offers a large number of jobs, generating commuting activities from the neighbouring French city of Mulhouse and German city of Lörrach. Although the border effects can clearly be seen between France and Germany, despite the linkages between Strasbourg and Kehl, when zooming in to Switzerland and more specifically to Basel, no border effects are evident. The larger differentials in terms of attractive job offers overcome the geographic, cultural, political and other differences. More specifically, commuting to Basel is currently witnessing a slight increase from the German side while stagnating from the French side. However, some sub-areas show increasing levels, especially the Mulhouse-Basel axis and along the Rhine valley on the German side.

Map 4 Commuting flows in the Upper Rhine



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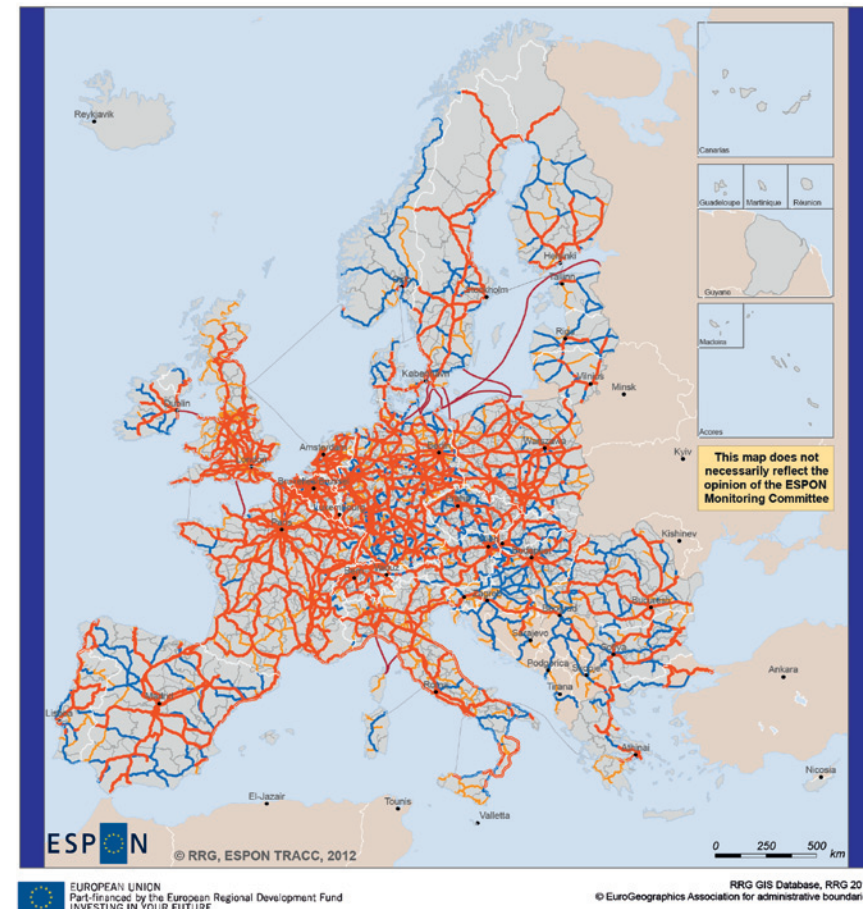
Regional level: LAU2
Sources and origin of data: France / INSEE (Recensement de la population 1999);
Switzerland / BFS (Recensement fédéral de la population et des entreprises 2000/2001);
Germany / Statistisches Landesamt Baden-Württemberg & Bundesagentur für Arbeit (2000)
Administrative divisions: SIA801
Conception: Manfred Perle, Martin Schuler
Mapping: Abram Pointet/Micro-GIS, Alain Järne

6.2 Rail connections

Europe is characterised by a dense railway network. Both the morphological and geographic features of the European territory, as well as the available infrastructures, are the main prerequisites for a successful and well-connected rail network. Having signed specific agreements, all four ESPON Partner States take part, together with all EU Member States, in the European Transport Policy, which has shown remarkable results in relation to the connection of several regions in different modes. There are, however, a number of differences with regard to the rail connections specifically relating to the density of the tracks and differences of type. Map 5 distinguishes between the four main rail line types: Main lines with multiple tracks, main lines with single tracks, secondary lines and rail ferries. It is immediately apparent that Central and North West Europe are the two areas, which demonstrate the densest connections in respect of main multiple tracks. In the regions to the east, the very north and the south of Europe dominate the main lines of single tracks. Secondary lines are to be found all over the territory since they are tasked with connecting the main lines with further destinations. Rail ferries are mainly built in order to facilitate connections between coastal areas, especially in the North, for example connecting Denmark and Sweden or Germany, Germany and the North East, Sweden and Poland, Ireland to the UK, the UK to France and Western Italy to Corsica.

Switzerland has a particularly favourable position as far as rail connections are concerned. Situated in the heart of Europe, Switzerland is very well integrated in the TEN-T policy and linked with its neighbouring countries via multiple track lines (shown in red in Map 5). There are direct fast connections from most Swiss cities to the

Map 5 European wide rail network



European-wide rail network (for European accessibility analyses)

- Main line, multiple tracks
- Main line, single tracks
- Secondary line
- Rail ferry
- Other rail lines (non-modelling network)

The European Transport Policy in the ESPON Partner States

Transport is one of the European Union's main sector policies. EU transport policy encompasses all modes of transport, i.e. air, rail, road, maritime and inland waterways, aiming at the creation of faster, more environmental friendly and growth-related transport facilities across Europe. Especially in the rail sector, the European Union has been very active in promoting the transnational integration of rail networks, building on core infrastructure which connects regions in different European countries. Both the EU Member and Partner States take part in this network investing money in this kind of infrastructure project. The new rail network will connect Eastern and Western Europe and will be completed by 2030. This core network is comprised of nine major corridors: two North-South corridors, three East-West corridors and four diagonal corridors. According to the new TEN-T corridor map, the Partner States are also included as part of the main future corridors. More specifically, Norway is part of the Scandinavia-Mediterranean corridor, which connects the very north of Europe with its southern parts. Switzerland is also a key player in this field. Being part in the Rhine-Alpine multimodal corridor, Switzerland has participated in key projects building base tunnels in its territory, which serve to connect it with its neighbours. In addition to the above-mentioned routes, five transnational axes have also been identified, which develop networks beyond the EU including the Northern Axis which connects the northern EU with Norway to the north, as well as Norway to Russia, through Sweden and Finland, and the South Western Axis which connects the south western EU with Switzerland and Morocco.

main neighbouring cities in France, Germany and Italy but also to other big cities across Europe. Basel, for instance, is well connected to Strasbourg, Mannheim, Mulhouse, Frankfurt and even Paris, Luxembourg and Milan, Zurich to Paris, Stuttgart, Munich, Frankfurt, Milan and Innsbruck, Genève to Paris and Lyon and Milan, Lugano to Milan. Night trains are also offered to Denmark, the Czech Republic and Hungary etc. In the centre of the country there are also single tracks to be found, which facilitate shorter distance trips. Being part of this chain, Liechtenstein serves as a hub to further neighbouring connections. This advanced rail connection network constitutes Switzerland and its neighbour Liechtenstein as a primary hub in the Centre of Europe, both for flows of people and goods.

Oslo is the main Norwegian railway hub. Single tracks connect the capital to other core cities all over the country up to Bodø in the north. Map 5 shows a distribution from Oslo to Stavanger, Bergen, Trondheim and Bodø, while some secondary lines connect other peripheral areas to the main single track, with access both to Oslo and to other cities. A number of stakeholders wish to promote the need for an improvement in the rail connection from Oslo to Gothenburg and on to Copenhagen. These stakeholders have gathered in a transnational grouping called "The Scandinavian 8 million city". The north of the country has a very limited railway infrastructure. Due to the sparse settlement patterns and long distances, an expansion of the railway system is not envisaged.

Iceland has no railways, and is therefore not involved in this aspect of European Transport Policy.

6.3 Air accessibility

The European core concentrates important global and European air traffic gateways. Cities or regions with an airport offering direct international flights to other global hubs serve as global gateways. Central parts of the UK, the Netherlands, large parts of Western Germany and parts of France are all served by a big airport with good international air connections and the gateway functions of these larger airports. Such airports facilitate direct flights to multiple European destinations too thus also endowing these cities with European air transport gateways status. Capital cities such as Lisbon, Madrid, Copenhagen, Warsaw, Rome or Prague also benefit from international airports from where large numbers of international destinations can be reached. South-western Europe also enjoys a good level of global connectivity, which can also be found in non-capital cities. These regions benefit from serving several global destinations on their own, or having good access times to other European intercontinental flights.

Zurich, Oslo and Reykjavik as promising air transport gateways. Direct flights to Asia (Mumbai, Beijing and Shanghai), Africa (Johannesburg), Latin America (Sao Paulo), North America (Chicago, New York and Montreal), but also to the main European capital cities and global gateways such as London and Paris, make the airport of Zurich a main central European hub for intercontinental and European flights. Oslo also offers a respectable amount of international flights mainly to cities in the U.S.A such as New York, Orlando and Los Angeles, to St. Petersburg in Russia, to numerous destinations in Asia in addition to a large number of

direct flights and charter destinations encompassing capital cities all over Europe. Reykjavik airport has established itself as an important platform connecting flights from and to Europe with flights from and to Northern America. Rather consciously it has developed its function as gateway connecting Europe and North America and offers a number of direct flights to the U.S, e.g. to Seattle, New York and Washington, benefiting from its geographic position, while several direct flights to European capitals are also offered. The air connectivity of Reykjavik is therefore particularly good, especially when compared to the population of Iceland or of the Reykjavik region. Liechtenstein is one of the few countries in Europe that does not have an airport. The nearest major airport is Zurich airport in Switzerland, which covers the needs of Liechtenstein. Profiting from the short distance and the good connection services (1.45 hours by public transport from Vaduz to Zurich airport), this airport is easily accessible for people in Liechtenstein.

Examples of airport accessibility in remote areas in the ESPON Partner States

Regional air accessibility as a local development indicator: The cases of Switzerland, North Iceland and North Calotte. Air accessibility and the availability of air connections are viewed as major factors in development. Taking into account the fact that the Partner States are countries with territorial specificities, being either remote or having large mountainous areas, the development of good regional airport connections facilitates accessibility in these areas. Map 6 shows the airport infrastructure endowment, zooming in on the regions of Iceland, Switzerland and Norway, i.e. North Iceland, the cantons of Jura and Valais in Switzerland and North Calotte, formed by the northernmost parts of Norway, Sweden and Finland, by providing useful inputs to an exchange between the European and local/ regions on transport issues. Although European maps typically focus on the integration of the continental territory, the local actors identify obstacles to economic development related to transport that are not necessarily limited to Europe or focus on improved connections to large population areas, but rather on observed bottlenecks for exports or local environmental issues related to transport.

While the highest values of regional accessibility are well correlated to the proximity to a major international airport, as is the case for example for Jura and Valais, lower air accessibility is a result of both a more peripheral position in the European airport system and a lower infrastructure endowment.

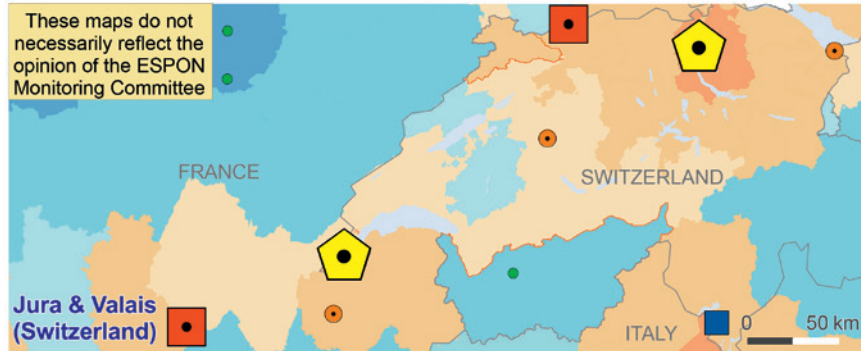
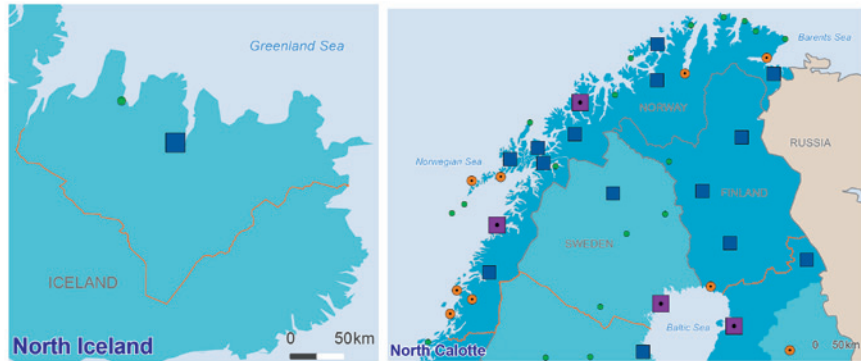
North Iceland: Well connected to the Arctic. North Iceland, despite its remoteness holds an important position in the air connectivity field. With moderate air accessibility but an interesting air passenger profile the region wishes to position itself as a major air transport gateway to the Arctic. Due to its position, Iceland offers good air accessibility to global destinations and has access to intercontinental flights and connections especially to North America. Reykjavik also offers direct flights to the main airports of all the countries adjacent to the North Pole, which enables it to promote itself as a “hub” for polar interaction and cooperation.

The central position of the cantons of Jura and Valais is an asset. Due to their geographic position, these two Swiss cantons are located at the centre of a web of well connected metropolitan areas, which increases their own accessibility. Another issue to consider is the cultural and linguistic differences between the two cantons. On the one hand, Jura is located in close proximity to the metropolitan area of Basel, to which a large number of inhabitants commute. However, the language barrier between the French speaking canton and German speaking Basel is considered an obstacle for further integration and infrastructure development in the area. The number of passengers in the Swiss case exceeded the 10 million for 2007, which could transform the region into a potential regional air transport gateway.

National policies matter for air connections in remote areas. North Calotte is formed by the northernmost parts of Norway, Sweden and Finland. The air accessibility of this region is low compared to the rest of Europe. However, airport connections are of critical importance, considering the distance to the nearest cities and to the core European regions. Norway compares favourably to Finland and Sweden in this respect, with more numerous and more evenly distributed airports servicing over 100,000 passengers per year. Internal transport links plays a major role in the North Calotte region. Contrary to the situations pertaining in northern Sweden and Finland, northern Norway enjoys numerous internal connecting flights, making it possible to reach one area from the next without passing through Oslo and, in the process, strengthening Tromsø and Bodø as regional hubs and centres servicing the entire region.

6 - Transport corridors and the flow of goods, people and information

Map 6 Airport traffic and endowment North Iceland, in Jura & Valais and in North Calotte compared to European measures



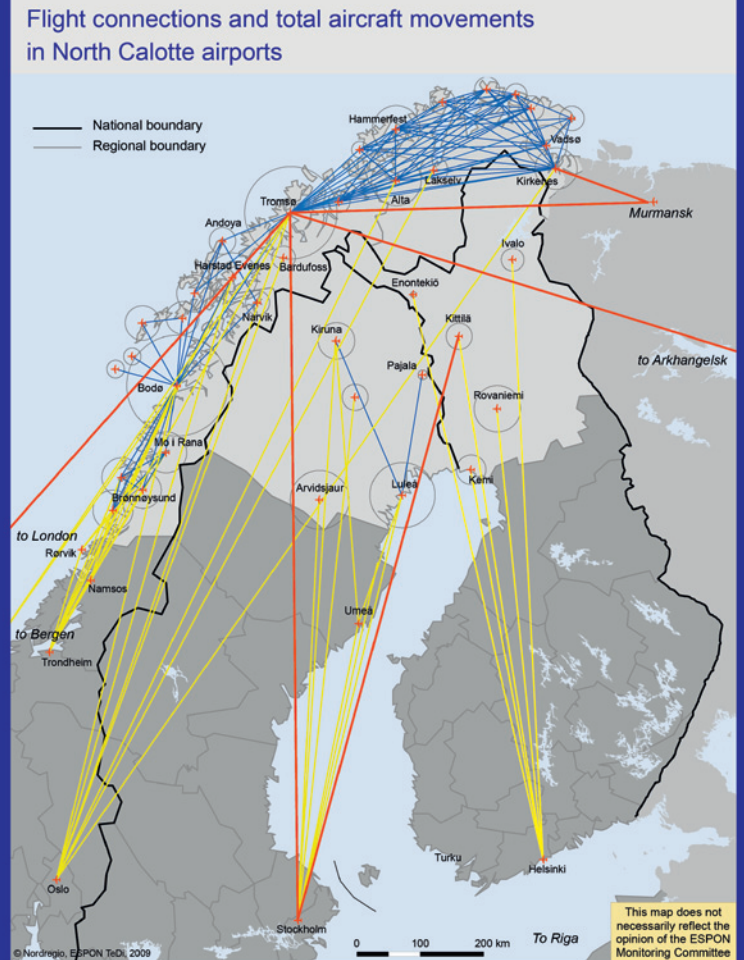
- Standardised potential accessibility by air in 2006 - ESPON = 100**
- > 150
 - 110 - 150
 - 100 - 110
 - 90 - 100
 - 50 - 90
 - < 50
- Number of passengers at airports in 2007**
- > 10 million
 - 2,8 - 10 million
 - 800 000 - 2,8 million
 - 100 000 - 800 000
 - 50 000 - 100 000
 - < 50 000
- Delimitation of the case study areas**
- Non ESPON space

North Calotte: number of passengers in 2006
 Sources: Spiekermann & Wegener, Urban and Regional Research (S&W) for the accessibility indicator, Eurogeographics association and GISCO for administrative boundaries, national statistical institutes, Websites of respective airports (RO)
 © Nordregio, ESPON TeDI, 2009
 M elodie Martin, Erik Gleiersen, Alexandre Dubois

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Map 7 Flight connections and total aircraft movements in North Calotte airports



- Total aircraft movements 2006**
- > 30 000
 - 15 000
 - < 3 000
- Legend:**
- International connections
 - National connections to / from North Calotte
 - Connections within North Calotte
- Includes all types of flights (commercial scheduled & non-scheduled, private, freight and mail flights)

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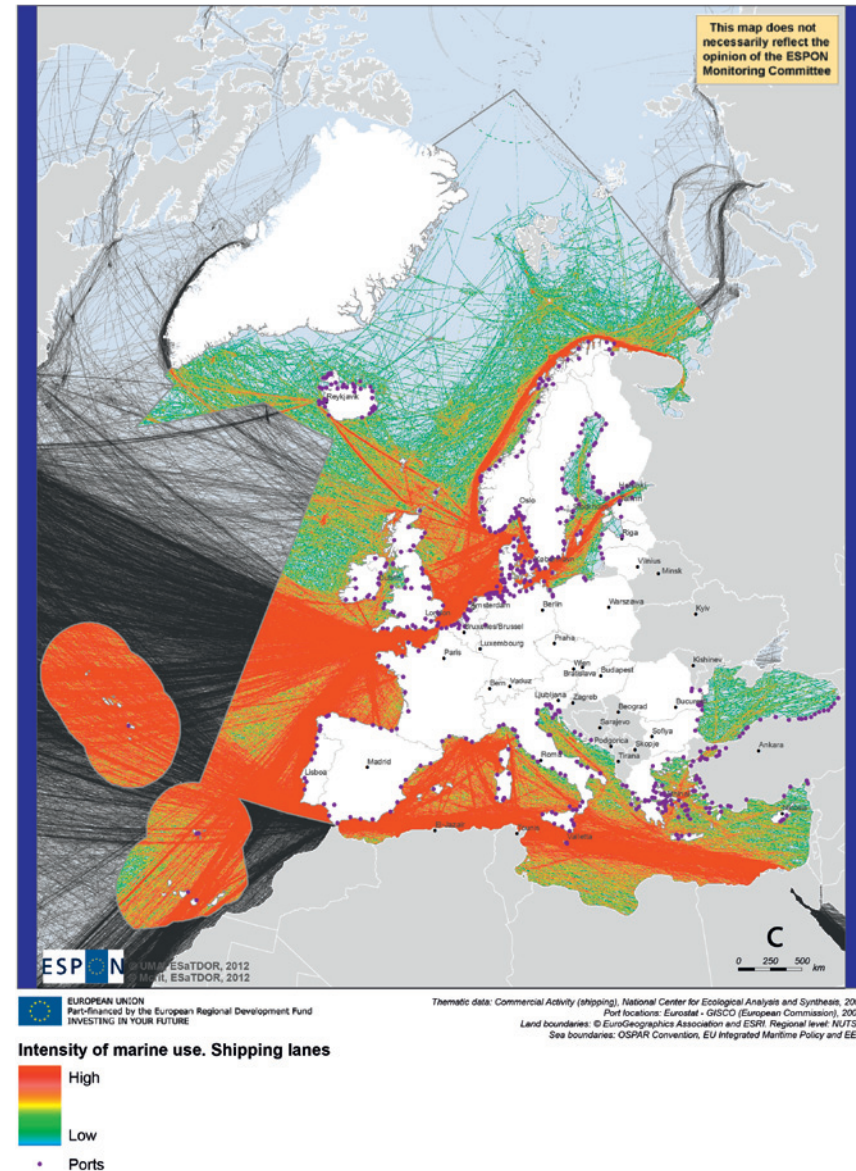
  Eurogeographics association and GISCO for administrative boundaries
 Data source: Eurostat, Avinor, L FV, Finnavia, Airlines webpages

6.4 Sea accessibility

Europe is a sea power. Shipping and port connections constitute an integral part of any discussion of transport modes since 80% of world trade is carried over the sea. Being surrounded by sea, 90% of the EU's trade with third countries passes through Europe's ports. The Channel and the North Sea share 40% of all port traffic in Europe, which is concentrated in the four largest ports, all belonging to the North West: Rotterdam, Antwerp, Hamburg and Bremen. These sea areas with high densities of marine traffic are shown in red in Map 8. Around 30% of the total maritime traffic is in the Mediterranean, where more than 200,000 vessels of over 100 tons cross the sea annually. The Baltic Sea is also performing relatively well, since 15% of the world's cargo transportation crosses this heavily trafficked sea. On the other side of the continent, the Black Sea has some strategic links with the Caspian Sea, the Mediterranean and the Bosphorus, though crossings are limited in terms of frequency and in relation to the size of ships.

The distance from the closest port matters and the further a region is away from a major port, the less accessible it is in terms of maritime transport. There are however some exceptions to this, primarily in cases where the infrastructure is not adequate or the travel costs too expensive, as is the case for example in Central and Eastern Europe. Map 9 shows that some Norwegian regions have ports of a size considered significant from a European point of view. This score for Iceland is less relevant, as it reflects the fact that no Icelandic port exceeds the threshold value of 4 million tonnes per year, which is linked to the nature of the economy and the size of the population. The recent development of the aluminium industry could however significantly change the Icelandic score in this respect.

Map 8 Intensity of marine use. Shipping lanes

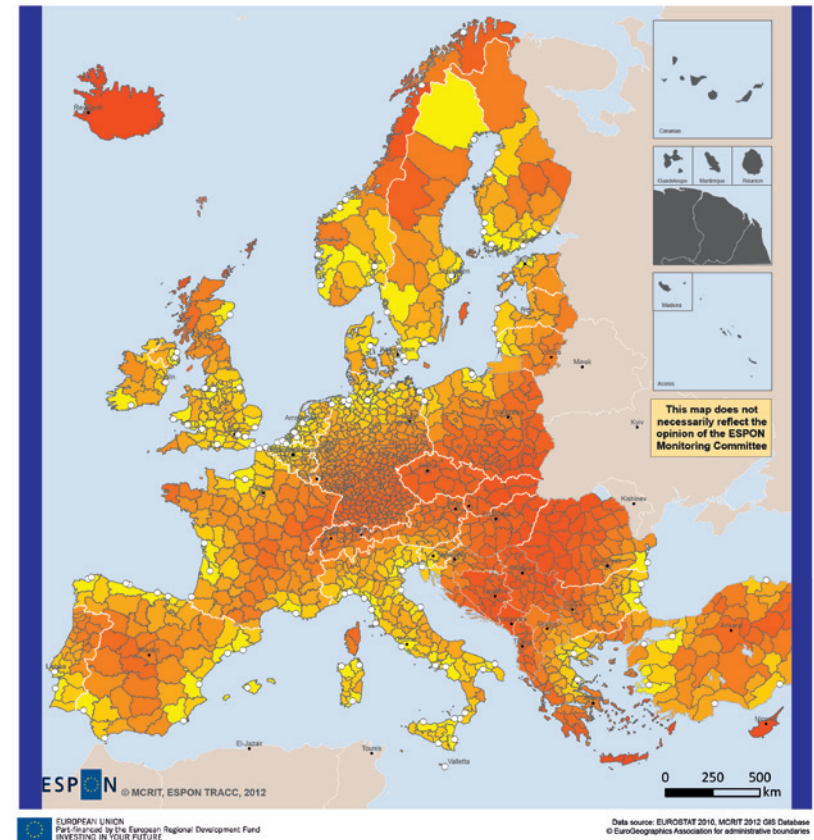


Iceland and Norway are important gateways to the Arctic. The two Partner States have extensive coastlines and therefore base part of their economic activities on maritime networks. Norway has a large number of ports along its coastline serving the needs of its regional industries etc. The intense level of traffic along the entire Norwegian coastline equates in volume to exchanges between North West Europe and North-West Russia. This traffic, which includes the extensive transportation of large volumes of oil, remains a significant source of environmental hazard. Moreover, traffic volumes could increase with an intensification of the traffic along the Northern Sea Route to the Bering Strait and the Far East. Similarly, Iceland's position in the North Atlantic may become strategically much more interesting if climate change makes it possible for freighters to use the Northwest Passage. Currently, there are significant flows both in the direction of European ports and, on the western side, to North America

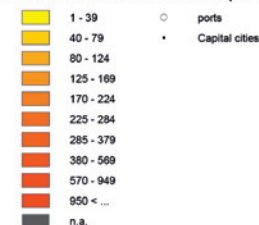
Switzerland and Liechtenstein minimise the travel costs to the nearest ports. Accessibility here is subject to the geographic position of each region and the available infrastructure, which in this case are the maritime freight terminals. Focusing on ports with traffic volumes of at least four million tonnes throughput per year, map 9 shows how much it costs to reach the nearest port by road transport. The map shows that Iceland has no port of that size while Switzerland and Liechtenstein face comparably high transport costs reaching ports of this size. This has a significant effect on the costs incurred in relation to the import and export of goods from/to global markets.

Although landlocked inland regions are often far from the sea, some of the regions of central and western Europe share the advantage of good connectivity and low travel

Map 9 Travel costs to access the nearest maritime port



Travel Cost to access nearest maritime port. Ports with traffic of more than 4Mton in 2010 (euros)



6 - Transport corridors and the flow of goods, people and information

costs in relation to accessing their nearest ports. Despite the fact that they do not have direct access to the sea, Switzerland and Liechtenstein have invested significantly in advanced transport infrastructure, e.g. in good rail and road connections, which enables both to reduce travel costs and travel times to the nearest ports. In other words, by minimising the road or train costs to reach their port destination, the cost of accessing the nearest port is also reduced. This facilitates trade as well as the import and export of various raw materials and products from and to other countries all over Europe and the rest of the world. One of the most important corridors in this respect is the one running from Rotterdam to Geneva.

7 - International, national and regional gateway cities

Selected key messages:

- Although the critical mass of cities in the Partner States is not as big for instance as London or Paris, they still can play an important role.
- Transport is a primary indicator for identifying gateways. Focusing on the Partner States, Zurich and Reykjavik function as global and European air connection gateways, while Zurich, Basel, Geneva and Oslo function as European and national rail gateways.
- Network participation can also identify business gateways on different geographical levels. Characteristic examples are Zurich, Vaduz and Oslo.
- Partner States' universities are European and national knowledge hubs. More specifically, the universities in Zurich, Bern, Geneva, Lausanne, Oslo, Reykjavik and Akureyri are internationally recognised knowledge hubs.
- Tourism is a key priority not only for the southern European countries, all of the Partner States also experience high tourist traffic volumes, both in the Swiss Alps and in the regions of Norway and Iceland.

Gateways are about flows, geographical reach and different functions. This means that a gateway is an entrance and departure point or node of a larger network. Flows of goods, people, services, ideas etc., pass through the gateway to and from other places. Gateway cities also share two main characteristics: geographical reach and different functions. Therefore, cities may function as gateways on an international, national or even regional level and cover functions such as transport, business and economy or knowledge and human attraction, one example of which would be tourism.

Transport hubs indicate gateways. As noted previously, transport is one of the main indicators used to identify


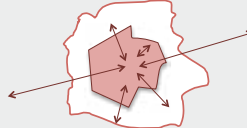


global, European or domestic hubs that may be considered gateways. Different transport modes such as air, port and road connections identify different gateways in different regions. The infrastructure plays an integral part in developing gateways, as well as in the creation of a stronger profile build on the comparative advantage of the region and its tight networks and functional links with its hinterland. The Partner States demonstrate a high level of participation in the transport field in accordance with the comparative advantages of each country.

Apart from transport, gateways also have other functions. As they play an important role in the economic sector, gateways focused on the economy and business are also identified. Moreover, gateways related to knowledge and human attraction can be identified at the international, European or regional level. Table 3 provides an overview of different gateway functions (shown in different colours) and some examples of European or international gateway cities in Iceland, Liechtenstein, Norway and Switzerland.

7.1 Key cities for economics and business

Network participation characterises gateways. One way to recognise a city or region as a gateway is to take a closer look at its network participation. The multinational firm networks use gateways for their internationalisation. Map 10 shows the worldwide networks of multinational firms, separating them into continental gatekeepers, continental representatives and intercontinental platforms. The size of the circle on the maps shows the total number of intercontinental, continental and extra-continental subsidiarity links respectively, to another European, or non-European city. The continental gatekeepers are those receiving overseas investments and then forwarding and/or spreading them across the same continent (Map 10a). Functional Urban Areas are viewed as continental

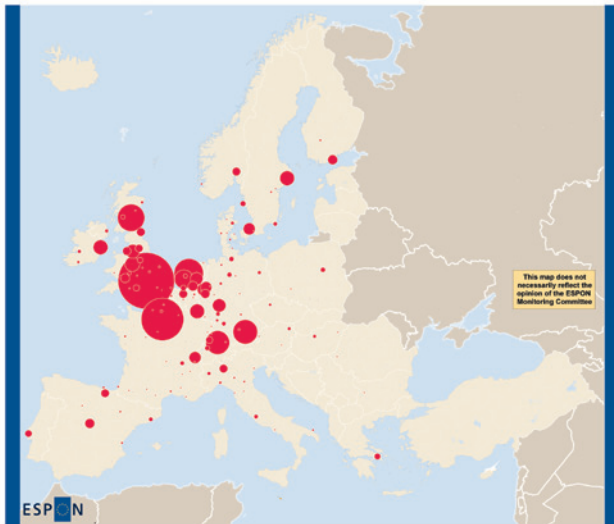
Table 3 Examples of European and International Gateway Cities in ESPON Partner States

Transport 	Air Geneva Oslo Reykjavik Zurich See section 6.3
Economics & Business 	Basel Geneva Oslo Vaduz Zurich See section 7.1
Knowledge & Research 	Bergen Geneva Lausanne Oslo Reykjavik Trondheim Zurich See section 7.2
Human Attraction 	Arosa Bergen Gstaad Malbun Reykjavik St Gallen See section 7.3

representatives when they offer to multinational firms the means to reach places outside their continent, i.e. outside Europe, as map 10b shows. Finally, the intercontinental platforms (map 10c) play the role of intermediaries between other continents for a range of financial or organisational functions coming from one continent, passing through Europe, and ending up in a third continent.

Map 10 Position of European cities as intercontinental (a) gatekeepers, (b) representatives and (c) platforms

Continental FUA Gatekeepers for Worldwide networks of multinational firms:

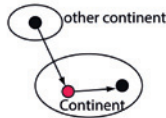
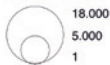


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Level: FUA
Source: IGLU-LAUSANNE, Rosenblat, 2010
Origin of data: CRBS, BVD, 2007

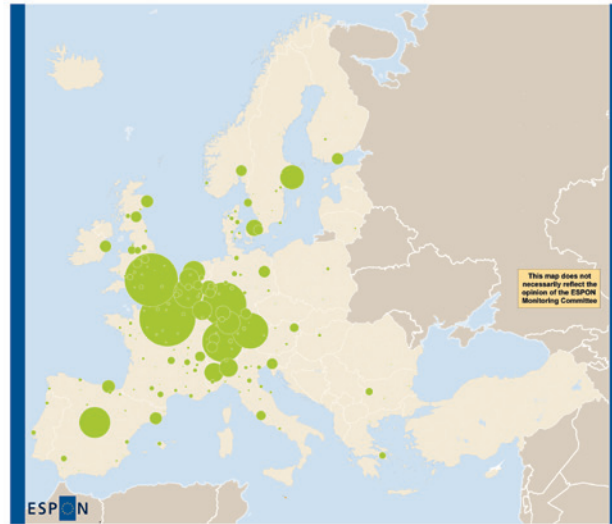
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Total number of Intercontinental subsidiary links passing by the FUA to another European city:



* in the sample of the 600,000 direct or indirect subsidiaries in the world of the first 3,000 first worldwide multinational firms

Continental FUA Representatives for Worldwide networks of multinational firms:

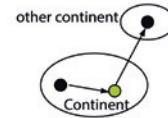


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Level: FUA
Source: IGLU-LAUSANNE, Rosenblat, 2010
Origin of data: CRBS, BVD, 2007

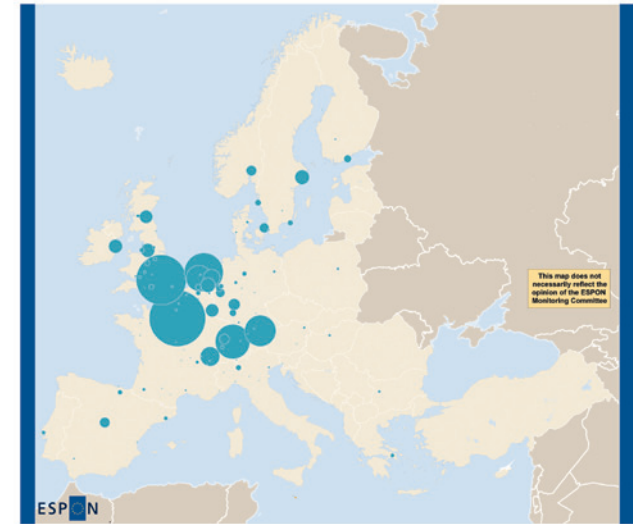
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Total number of continental subsidiary links passing by the FUA to another city outside Europe:



* in the sample of the 600,000 direct or indirect subsidiaries in the world of the first 3,000 first worldwide multinational firms

Inter-continental FUA Platform for Worldwide networks of multinational firms:

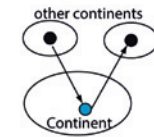


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Level: FUA
Source: IGLU-LAUSANNE, Rosenblat, 2010
Origin of data: CRBS, BVD, 2007

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Total number of extracontinental subsidiary links passing by the FUA to another city outside Europe:



* in the sample of the 600,000 direct or indirect subsidiaries in the world of the first 3,000 first worldwide multinational firms

London and Paris pave the way for business gateways.

Zooming in to the European city level London dominates as a continental gatekeeper, especially in terms of hosting North American and Asian headquarters in Europe. Paris also plays an important role as a “gatekeeper”. Amsterdam and Munich can also be seen as gatekeepers, though to a lesser extent, than London or Paris. The primary cities for ownership of companies outside Europe remain Paris and London, both of which function as stepping stones for banks. On the other hand, apart from London and Paris, again Amsterdam and Munich together with Rotterdam play an important role as ‘platforms’, i.e. as intermediaries facilitating extra-continental links to another city outside Europe. Nevertheless, both the types of capital needed for these three different types of cities, as well as the connectivity of these cities to the rest of Europe or the rest of the world are different. In addition, cities in the western part of Europe appear stronger in terms of network links, both at the intra- and extra-European level, compared to the cities - even the capitals - of Eastern Europe which operate rather more like satellites within these global networks.

Zurich and Oslo have an important role to play in business networks.

With the overall European picture in mind, it is difficult to discern the position of the ESPON Partner States in relation to this function since it is dominated in the main by big global cities like London or Paris. However, business networking plays a key role for both Zurich and Oslo, as illustrated by Map 10. Zurich is well integrated into the global networks of various leading activities, such as exchanges of information and leading economic activities. It is also highly ranked within European research networks and global firm ownership hierarchies. Despite its relatively limited size, Zurich appears to be a ‘gatekeeper’ at the European level,

as it receives intercontinental investments. Moreover, and to a greater extent, it should also be viewed as an intercontinental platform, acting as an intermediary for other continents, focusing mainly on financial or organisational activities. Vaduz in Liechtenstein also has an important role to play here too being particularly active as a ‘representative’ and ‘intercontinental platform’ for business.

Unsurprisingly, fewer links pass through Oslo than Zurich. However, the Norwegian capital region has maintained a stable position. It does function, to a minor extent at least, as a ‘gatekeeper’, but has very few intercontinental subsidiary links. A few more continental subsidiary links pass through Oslo to other cities outside Europe, while a similar situation prevails in relation to Oslo acting as an ‘intercontinental’ platform. Therefore, the links to cities outside Europe are denser both for Oslo and Zurich than to other European cities.

7.2 Key cities and regions in knowledge and research

Europe is a knowledge and innovation pool. Some cities serve as pivotal hubs for large global and European networks of knowledge and are key nodes for R&D and knowledge flows. Technologically advanced and scientific regions are to be found in Europe, while their networking extent can demonstrate their gateway function. In this context knowledge networking regions are understood as regions which are home to crucial nodes, such as are firms and universities which tend to co-locate in specific places. Knowledge is then diffused either through a pattern where spatial proximity is essential or via the establishment of intentional cooperation networks.

European core hosts most networking regions.

The countries situated in the central part of Europe demonstrate a high knowledge networking ability (Map 11). Most parts of Germany, some parts of central and southern France, Austria, London and its surrounding regions and cities, but also Switzerland and Liechtenstein, as well as some parts of Sweden and Finland are among the regions that are considered to be exemplar networking regions. These regions are also viewed as being technologically advanced in terms of being advanced manufacturing regions, advanced services regions and technologically advanced regions. In addition some of these are also regarded as research-intensive regions, such as some of the regions of Germany, or scientific regions, such as some of the regions of France or those around London. Clustering regions are to be found in Ireland, some parts of Scandinavia and in some parts of Spain, France and Italy. On the other hand, as map 11 shows in yellow, regions in the majority of the countries in the eastern part of Europe are recognised as non-interactive regions. These are regions with a relatively low level of technological advancement, as well as a low level of specialisation in knowledge activities. Only a very few regions, situated primarily in the eastern part of Germany and some few parts of France and the UK, are considered globalising regions.

Switzerland and Liechtenstein are outstanding in terms of knowledge networking in the European core.

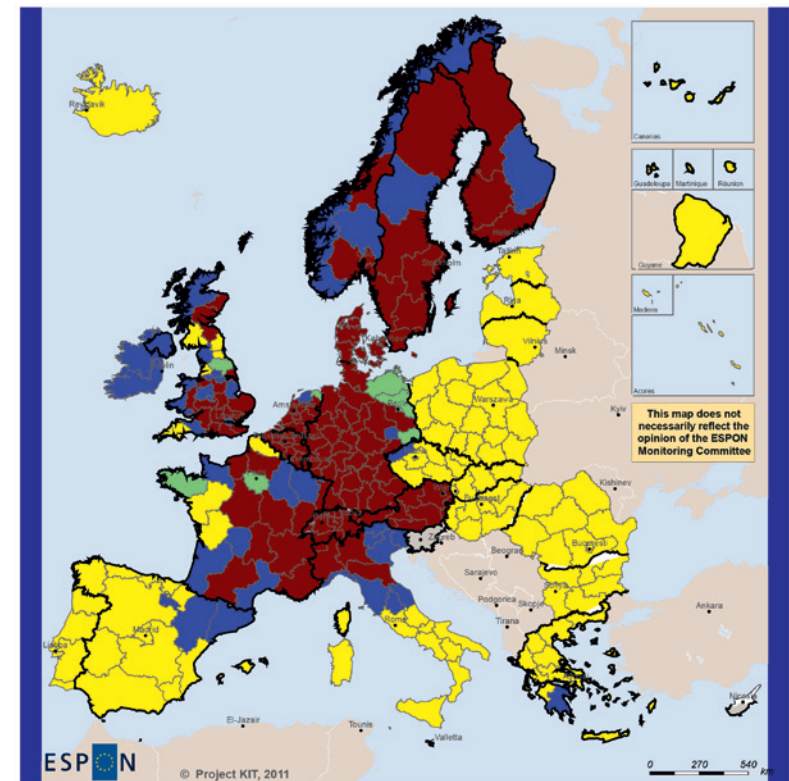
In the field of knowledge and technology, Switzerland and Liechtenstein demonstrate a dynamic picture. Hosting Universities and research centres, as well as being technologically advanced and demonstrating good networking activities can lead to the establishment of gateways in Europe and to being designated as an important hub for people in the wider area. They

7 - International, national and regional gateway cities

each display a higher than average scientific activity level and a higher than average high quality human capital level. Therefore, both play a significant role in the fields of knowledge and science, since their networking activities are high and can act as a hub for researchers, students etc., from all over Europe. The Swiss universities are ranked very highly in the top world universities with the ETH (Zürich Federal Institute of Technology) in particular scoring well. Other popular and well-ranked universities are the University of Geneva, the Federal Polytechnic School of Lausanne (Ecole Polytechnique Federale Lausanne) and the University of Basel, which host both domestic and foreign students. The University of Liechtenstein also has a relative high number of students though it remains far smaller than the aforementioned Swiss institutions. Well renowned research institutes, such as the European Organization for Nuclear Research CERN in Geneva, complete the picture.

Reykjavik, Akureyri, Oslo, Trondheim and Bergen form the university hubs. According to the typology reproduced in the context of map 11, Iceland has been viewed, in the main, as having scientific regions, due to the existence of its universities. Both the University of Iceland in Reykjavik and the University of Akureyri host a large number of students and launch student exchanges to Europe and Canada respectively. In addition, the Marine Research Institute in the capital of Iceland promotes research in that field. Iceland is also an advanced services region. Its networking activities however constitute the country as a non-interactive region. Norway demonstrates a quite diverse picture. Apart from some regions in the south west of the country, primarily around the city of Bergen, which are considered as technologically advanced regions, the remaining Norwegian regions are characterised

Map 11 Knowledge networking regions in Europe



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Regional level: NUTS 2
Source: AQR elaboration, 2011
Origin of data: OECD REGPAT Database, Coris, EUROSTAT, ISTAT and Institut National de la Statistique et des Etudes Economiques data
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Category	Meaning	Specialization in informal linkages	Specialization in formal linkages
1	Non-interactive regions	No	No
2	Clustering regions	Yes	No
3	Globalizing regions	No	Yes
4	Networking regions	Yes	Yes

Knowledge networking regions

- Non-interactive regions
- Clustering regions
- Globalizing regions
- Networking regions

as advanced services regions. In addition to these, regions extending from the centre of Norway to the very north as well as to the very south of the country are viewed as human capital-intensive regions, while the rest balance between being scientific regions and regions with no specialisation. The regions around the capital city of Oslo, as well as some parts in the centre of the country, are designated as networking regions. This is mainly due to the activities of the universities there. The University of Oslo, the Norwegian University of Science and Technology in Trondheim and the University of Bergen each have an important role to play in research and networking terms and are also ranked among the best 100 universities in the world. Together with its function as a clustering region, with the exception of the surrounding capital area and some parts of the centre, Norway acts a research-networking gateway.

7.3 Cities and regions with high attractiveness

European cities are still attractive. There are a number of different ways of identifying the attractiveness of an area. Tourist visits, for example, provide a good indication of the attractiveness of an area. Looking at migration and student exchanges also provides some insight in terms of the attractiveness of an area. Significant flows of in- and/or out-migration can also give a city gateway status. Migration can be driven by the desire for better career opportunities, for family reasons or for study. London, Paris, Berlin, Amsterdam and Barcelona as well as the Scandinavian countries attract a large number of tourists.

The Alps as a gateway for international and European tourism. Mountainous areas remain attractive, maintaining the Alps in a premier position as regards ski destinations. Seen in relation to a region's population size, international tourism is especially important in the Alps, putting the mountainous regions to the fore. In addition, many tourists from all over Europe consider ski resorts such as St Moritz, Gstaad and Arosa in Switzerland or Malbun in Liechtenstein as top ski tourist destinations for their winter holidays.

Norway and Iceland are also appealing for tourists. In relation to the local population, areas in Iceland and in the north of Norway also see large numbers of tourists. Given that the Partner States are viewed, to a certain extent at least, as knowledge gateways, the attraction of new students and researchers can result in them enhancing their regional attractiveness for young people.

The Partner States demonstrate integration potentials. After discussing a range of European policies it is clear that the Partner States have demonstrated that they can benefit from participating in the integration process. Despite their territorial specificities, being small or isolated, the Partner States take part in the European territorial cooperation programmes, exhibit high density levels of flows in certain fields, such as transport and knowledge, while they also play an important role in business. Indeed, many of the ESPON Partner States' cities function as gateways (see Table 3) which are well integrated into the European urban system.

The location of a wide range of international organisations in Geneva turns it into a gateway with a very particular function in international relations.

8 - Territories with specific potential and challenges

Selected key messages:

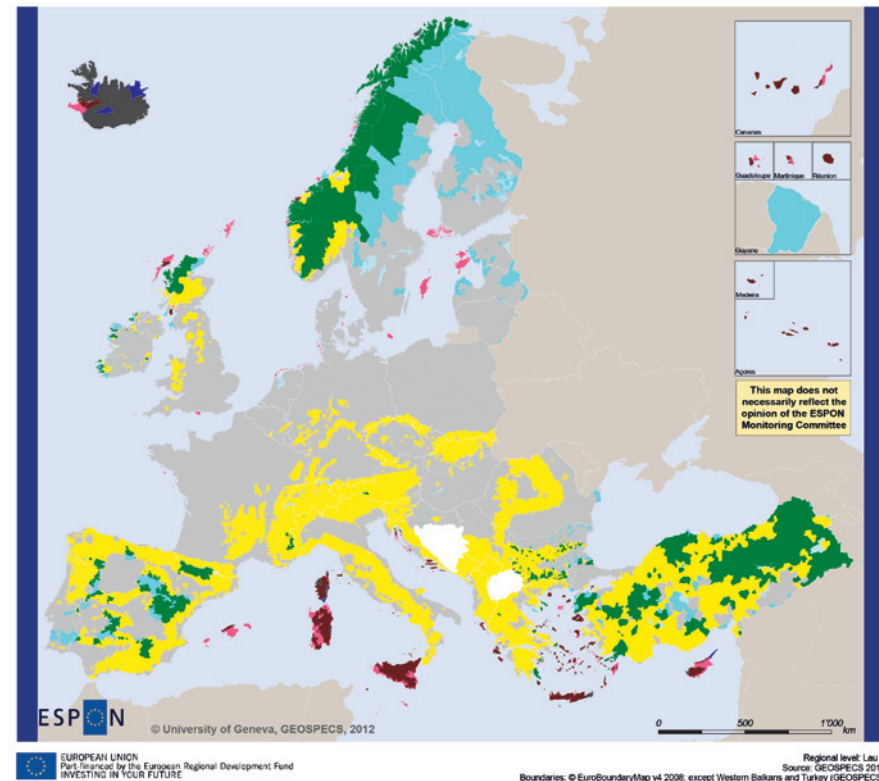
- The ESPON Partner States are key players in arguing for the importance of areal specificities, i.e. mountains, islands and sparsely populated areas.
- Among the main challenges of such areas are climate change and its environmental impacts and the maintenance of services of general interest at an acceptable level.
- However, some of the ESPON Partner States' specificities can be considered as potentials, e.g. through the better use of renewables and alternative resources.

Territorial specificities are afforded special attention by EU policies. Both the Territorial Agenda and the Europe 2020 Strategy address the issue of regions with special characteristics and offer possibilities for their development. The Partner States are good examples of countries with significant regional specificities though this has not prevented them from furthering their own development. Regions in the same parts of Europe often face similar challenges, for example, relating to sparsely populated areas, where they can often have similar employment structures as a result of this economic impediment. There is also however the potential here for clusters to develop in terms of natural resources, think for example of the paper industry in the Nordic countries or tourism destination clusters.

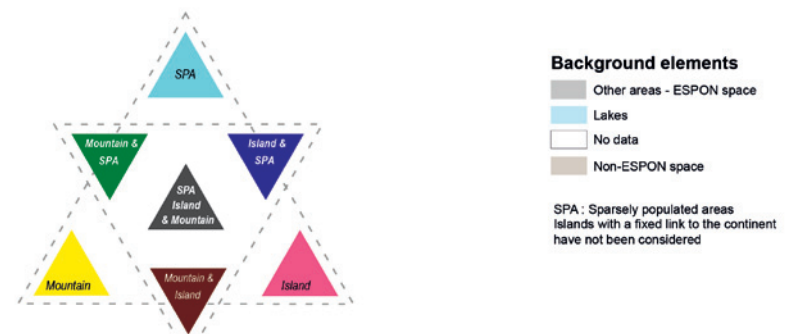
Geographic specificities can be divided in two categories:

- Areal specificities: mountains, island and sparsely populated areas
- Linear specificities: cross-border regions and coastal zones.

Map 12 Geographic specificities identified in each LAU-2 unit



Geographic specificities identified in each LAU 2-unit



The ESPON Partner States combine different regional specificities. As noted previously, the geographic location of the ESPON Partners, in terms of their linear specificities, generates specific challenges and potentials. It is however the areal specificities that will provide the main focus for this section. Map 12 shows that large parts of Europe are defined as regions with specificities, having different characteristics. These can be mountainous regions, sparsely populated regions, islands, or any combination of the above. Either located in the periphery or the core of Europe, the Partner States share different combinations of specificities. In short:

- Mountainous regions are delineated on the basis of altitude and the ruggedness of the topography.
- A sparsely populated local area is defined as an area where less than 100,000 inhabitants can be reached within daily commuting distance
- Islands are defined on the basis of their physical dimension

8.1 Sparsely populated areas

Sparsely populated local areas are defined based on daily commuting distances. In general, there are two reasons why a community is sparsely populated. In some cases this is because of poor transport infrastructure, e.g. in parts of Bulgaria or Turkey. In other cases sparsely populated areas are primarily linked to settlement patterns, e.g. in the northernmost parts of Europe. In both types of sparsely populated communities similar development challenges can be observed.

Large sparsely populated areas are to be found in some parts of Sweden and Finland, in some parts of the Baltic

States, some parts of the UK and in Spain. In addition, a combination of mountainous and sparsely populated areas can be found in large parts of Norway, stretching down the spine of the country from the very north to its southernmost point with only some western and south eastern parts, which though mountainous, are not sparsely populated, as exceptions. Iceland however presents a rather unique case combining all three areal specificities as its territory is a sparsely populated island with some mountainous areas.

Sparsely populated regions in Norway and Iceland mostly challenged by migration. Sparsely populated areas are characterised by limited opportunities to commute to urban centres and access to a limited range of services of general interest. One of the main challenges for these regions can be described as 'thinning-out'; this is when a region increasingly suffers from out-migration. People might migrate to the closest larger town while the people living in these places themselves move to other more urban centres. At the end of this process we can clearly see the emergence of a divergent pattern across a territory where the capital regions gain in population while the other regions experience population decline. Norway and Iceland are likely to be significantly impacted by this.

Growth potentials for Iceland and Norway related to natural resources and nature-oriented tourism. Sparsely populated areas not only have to cope with challenges but are also often afforded significant potentials by these very same territorial characteristics. In terms of the sparsely populated areas in Iceland and Norway, especially those in the far north, this can clearly be seen in relation to investment in continued forestry, mining and ecological agriculture, energy production and nature-oriented tourism, mainly due to the unexploited

natural landscapes and low potential for conflicts with the residents. However, further exploitation of these areas for mining, forestry or energy supply could hamper the potentials for tourism and disturb the generally good quality of life in these places.

8.2 Mountainous areas

In terms of social economic development, it is essential to distinguish between mountainous areas within and those beyond commuting distance from urban centres providing services and employment opportunities. Most parts of central Europe as well as some parts of southern Europe, e.g. around Spain, as well as some parts of Italy, the Balkans and Greece are identified as mountainous areas (Map 12). Each of these areas is located along one of Europe's large mountain chains. The Alps, which cover a large part of Switzerland and Liechtenstein, are the longest sierra in Europe and the main territorial characteristic of these two countries. However, all four ESPON Partner States are defined as mountainous areas. The challenges faced by each are however rather different. This is also due to the combination of mountainous regions with sparsely populated areas in northern Europe.

Climate change challenges the mountainous areas of the ESPON Partner States. Climate change is most visible due to projected decreases in snow cover. A decrease of at least 30 days of snow cover is predicted, in some studies, for all mountainous areas as defined in map 12. This, in combination with increased rainfall, and more extreme weather events (and glacier ablation at higher altitudes), will increase the risks associated with natural hazards and also affect water supplies downstream. For example, mountainous areas relying on winter tourism will be negatively

8 - Territories with specific potential and challenges

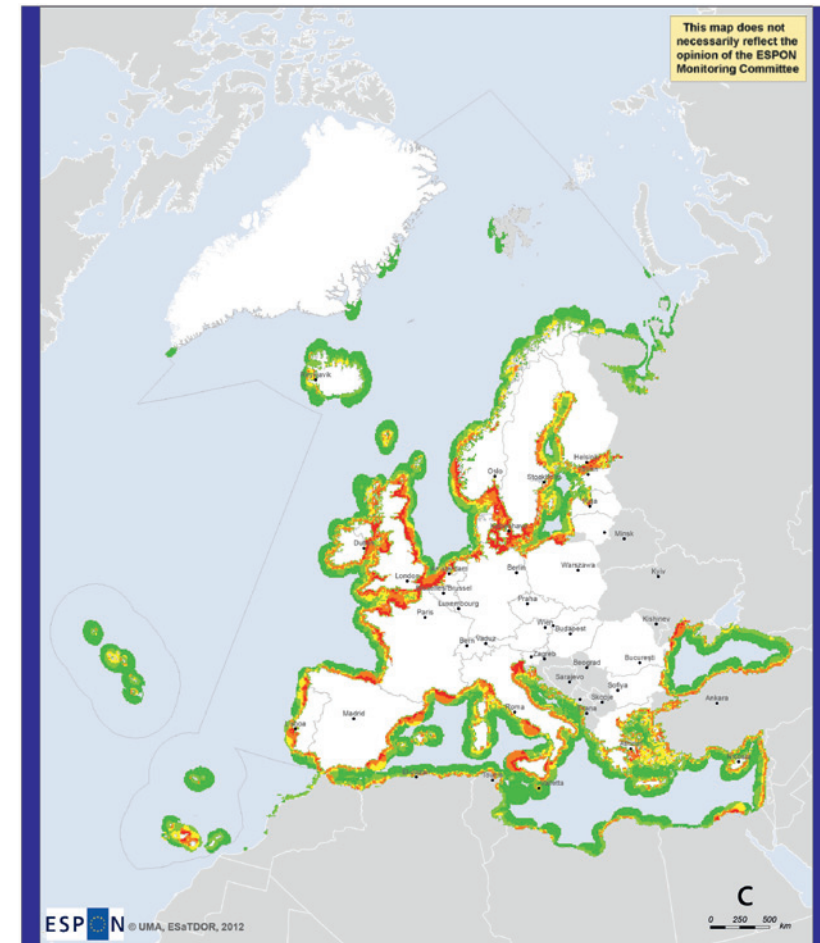
affected in economic terms. For every degree increase in temperature, the snowline will, on average, rise about 150 metres in elevation. Investments already made in relation to ski infrastructures thus may no longer be suitable with these future perspectives in mind. This is however likely to present more of a challenge for popular ski resorts in Switzerland and Liechtenstein than for Iceland and Norway, since some regions in the first two countries rely much more on tourism. In addition, there is also a change in landscape, as melting glaciers form new landscapes and lakes.

Renewable energy and water supply potentials for the mountainous regions of the Partner States. The ESPON Partner States contain a large share of Europe's fresh water reserve, in their glaciers, lakes and rivers. Therefore these mountainous regions are sometimes referred to as Europe's "water towers". If energy prices rise, this water could potentially be used on a large scale as a sustainable energy resource. As noted previously, Norway and Iceland already generate a large share of their final energy consumption from renewable sources like hydropower.

8.3 Islands

The size of an island and the relative distance to the mainland determine the challenges to and the potential of Europe's Islands. Sizes and therefore needs differ across Europe. For example, some coastal parts of Norway and the entire country of Iceland are defined as Island in the above map. Smaller islands, such as Malta, Cyprus or the Greek islands however face altogether different challenges from those of the bigger islands, such as Iceland. Having a well developed infrastructure and promoting accessibility are key factors in tackling

Map 13 Environmental pressures



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Environmental Pressures Composite Map

- Very Low
- Low
- Medium
- High
- Very High

Thematic data: Environmental Pressures Composite Map
Land boundaries: © EuroGeographics Association and ESRI. Regional level: NUTS2
Sea boundaries: OSPAR Convention, EU Integrated Maritime Policy and EEZ.

8 - Territories with specific potential and challenges

the core challenges presented by these areas and ultimately contribute to their further progress.

Insularity challenges the level of services of general interest. Low population density and low accessibility present significant challenges for the provision of service of general interest which often require a minimum number of users. The main challenges for island regions are e.g. ensuring that an adequate infrastructure exists, promoting economic specialisation in the face of limited resources and combating out-migration for employment.

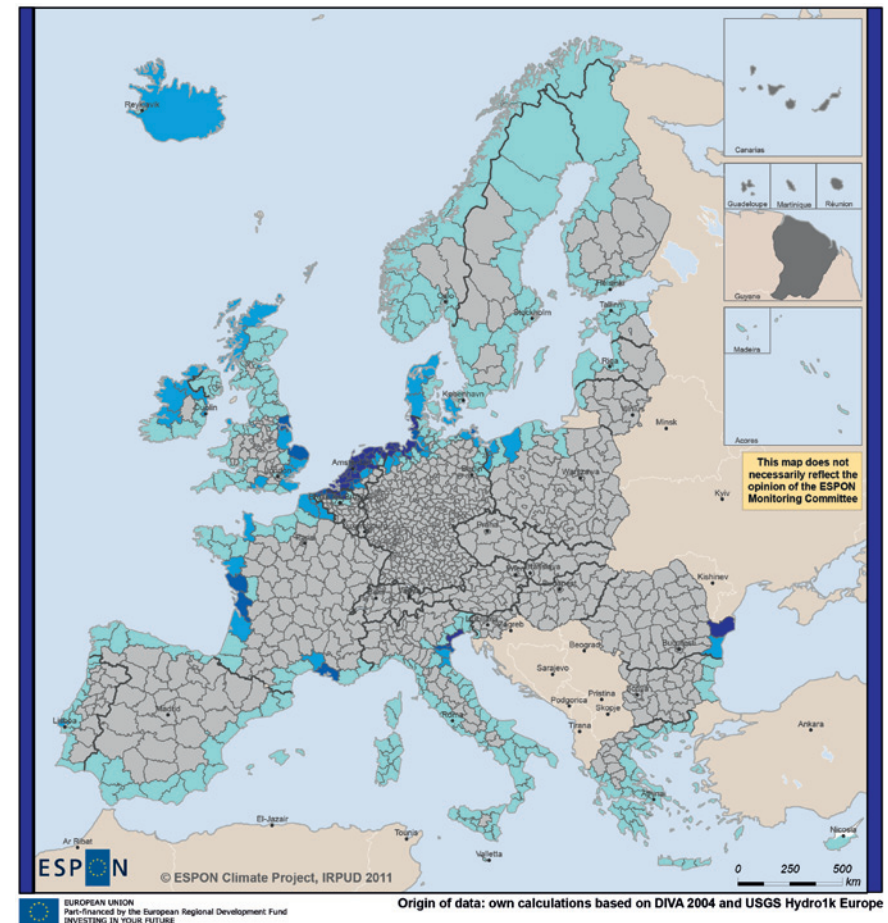
Insularity has potentials. Islands often boast beautiful unspoiled landscapes and rich ecosystems. This can represent a potential for tourism. Many of Europe's islands are popular tourist destinations. Besides, islands often have a strong societal network including a shared culture and social ethic, resulting in low crime and the preservation of tradition.

8.4 Specific territories are particularly vulnerable to environmental issues

The challenges and potentials discussed above for the three main defined territorial specificities result often in extra sensitivity to climate change, as a horizontal theme. The vulnerability of the ESPON Partner States to climate change depends on the interaction of diverse factors including their territorial specificities.

Islands and coastal areas are among the areas that are most exposed to sea level rise, storms and flooding. In addition to the climate challenges described for mountainous areas, islands and coastal areas are also significantly affected by climate change. As maps 13 and 14 show, some areas in Europe are more vulnerable than others. The environmental pressure around

Map 14 Change in exposure to coastal flooding



Change in regional exposure to coastal storm surge events

- highest negative impact (0.5 - 1.0)
- medium negative impact (0.3 - <0.5)
- low negative impact (0.1 - <0.3)
- no/marginal impact (>-0.1 - <0.1)
- no exposure
- no data

Inundation depth changes due to a sea level rise adjusted coastal storm surge event.

Calculated on the basis of regional coastal storm surge heights projected by the DIVA model for a 100 year return event and heightened by a 1 m sea level rise.

For details on no data availability see Annex 9.

8 - Territories with specific potential and challenges

more densely populated coastal areas is higher than in other regions. Map 13 presents the environmental pressures, i.e. the human impacts on the marine environment, for instance through both land- and sea-based activities, such as shipping or agriculture. This is based on three main indicators: the incidence of invasive species, organic pollution (pesticides) and inorganic pollution (fertilisers).

The environmental pressure on harbour areas is high given that they are often focal points for invasive species. In addition, the map shows areas where land based organic and inorganic pollution related to farming and industrial activity is at its most intense. This is also the case for Norway and Iceland. In terms of changes in the exposure rate to climate change Norwegian coastal areas are less affected than those of Iceland. Most affected areas can be found around the Atlantic, North Sea and Baltic coastlines, with additional hotspots to be found in a number of Mediterranean and Black Sea coastal areas.

More concrete examples can be seen in Europe's delta areas, in Romania, the Danube delta and in the Netherlands in the Rhine delta. This is due to a rise in the volume of melt-water from the Alpine region. In addition, mountainous regions, such as those in Switzerland and Liechtenstein, are also affected, i.e. they are more sensitive to flooding due to melting water. Often, however, these challenges also bring with them potentials for energy production related, for instance, to tidal wave energy, hydropower and the potential for wind energy in mountainous areas and in the North Sea.

Coastal areas are among the most vulnerable to climate change as they are more exposed to the consequences of coastal flooding. Map 14 shows that most regions have a marginal impact on their coastal areas, including those in Norway. Changes in inundated areas will remain quite marginal. Examples here include the coastal areas around Spain, Portugal, Greece and Italy, some parts of western France, as well as areas in the north of Europe, such as Sweden, Finland and the Baltic States. Norway also belongs to this category, demonstrating a marginal impact on its coastal areas. On the other hand, there are regions which can expect more severe changes. These are, primarily, those regions along the Dutch-German coastlines but also in those Denmark and France. Compared to Norway, Iceland will see relatively less of an impact from coastal flooding. However, the most severe changes are likely to be seen in some of the regions of north eastern Italy and in the coastal region of Romania. Putting in place an adequate and developed infrastructure would benefit these regions and protect them from future challenges.

It is not just challenges that the ESPON Partner States face in the environmental field, great potentials can also be unveiled presenting hitherto untapped opportunities for these countries. Investing in renewable energy and exploiting its possibilities offers a good alternative in terms of seeking to benefit from the specificities of an area.

The risk of avalanches concerns all of the ESPON Partner States. Avalanches are very local phenomena

occurring along certain slopes and valleys at irregular intervals. As such, it is not possible to scientifically pinpoint the frequency or probability of avalanches, but only to identify the concerned regions. It is estimated that climate change may increase the risk of avalanches, due to more abundant snowfalls in winter, higher storm frequencies and milder winters. We may therefore see a larger number of catastrophic avalanches affecting settlements and infrastructures in the future. However, a large number of avalanches are also linked to the development of skiing and mountaineering, as tourists trigger the avalanches through these practices. The risk of avalanches concerns Norway, Switzerland and Liechtenstein, as shown in Map 15, and also Iceland. The ESPON Partner States have expertise and research organisations that focus on methods to reduce the exposure to avalanche hazards. These organisations are already involved in numerous international cooperation projects. Another hot topic in the Alps is permafrost.

The North Sea is a hotspot for offshore wind energy.

In geographical terms the installed offshore wind energy capacity is concentrated in the North Sea with further focal points in the Irish and the Baltic Seas. North western Atlantic areas exposed to frequent weather fronts have the strongest average wind speeds, followed by the other western Atlantic areas, the North Sea and the southern Baltic. Areas which are fully exposed to the Atlantic have the greatest capacity to develop wave power. As a result, the exploitation of marine renewable energy resources can be seen as producing 'added value' to the blue economy of the region, i.e.

8 - Territories with specific potential and challenges

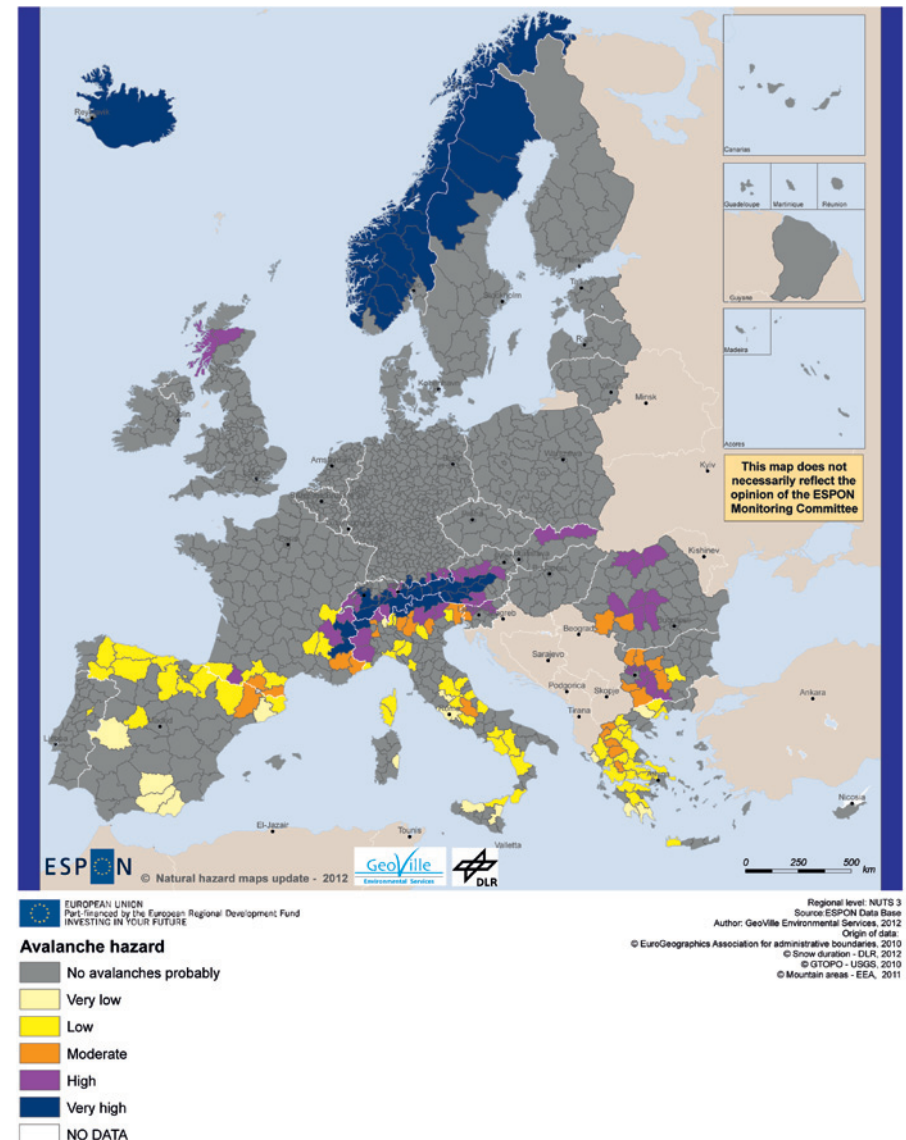
the economic growth deriving from the exploitation of the seas. In this respect Norway has a comparative advantage due to its particular geographic position. On the other hand, given its already high oil and gas reserves, Norway is a lead player in the conventional carbon-based energy field.

Iceland's geothermal potential. Iceland has a special position in Europe, as it is one of the few volcanic islands on the continent's periphery. Given this specific attribute, a geothermal zone crosses Iceland diagonally and therefore most of its people have access to geothermal water (Map 16). This potentially provides Iceland with a significant opportunity to invest in geothermal rather than carbon-based gas energy. Other important environmentally friendly policies adopted by Iceland include initiatives such as those relating to the cooperation among municipalities for waste management and composting.

Hydropower in Switzerland. Switzerland also demonstrates potentials in the use of alternative energy resources. Positioned in a mountainous space, the country is rich in water resources. As a consequence, hydropower remains Switzerland's most important domestic renewable energy source.

The national energy strategy adopted by the Liechtenstein government in 2012 sets a target of 20% to be reached in 2020, in line with the Europe 2020 target.

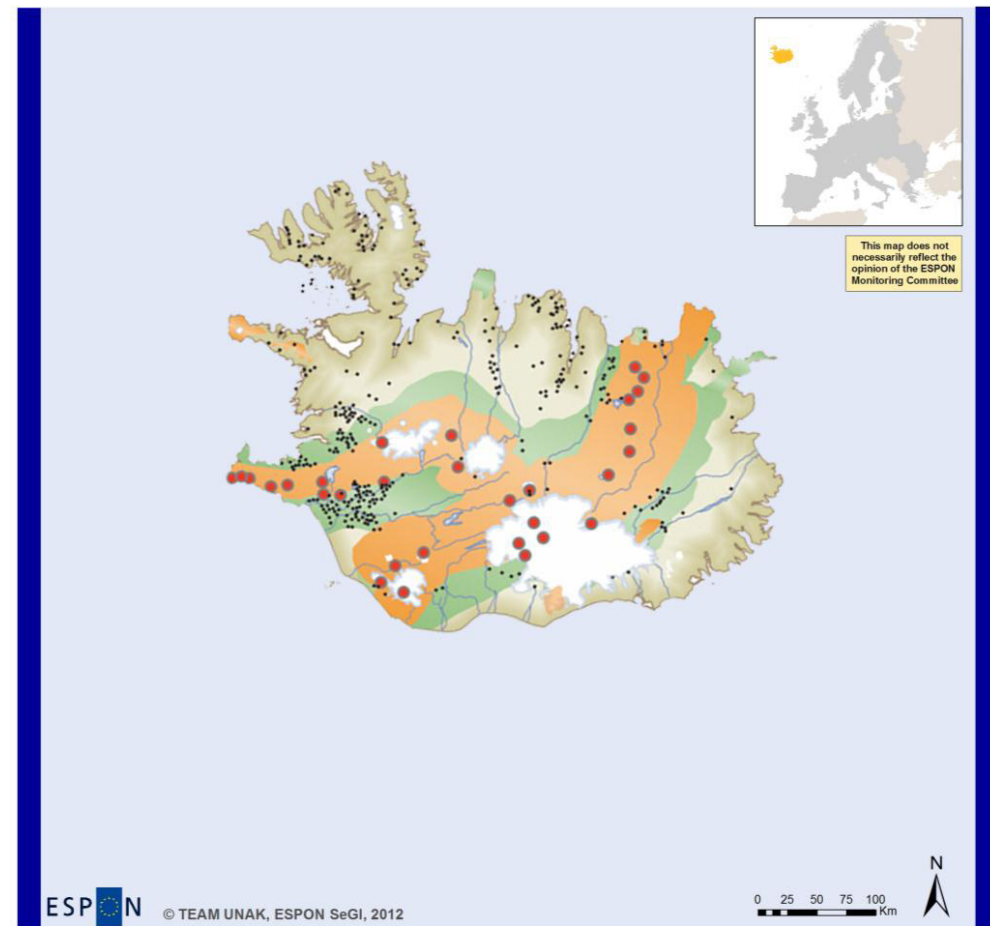
Map 15 Avalanche hazards



8 - Territories with specific potential and challenges

The ESPON Partner States have proven that regions with territorial specificities can nevertheless develop their own comparative advantages. Building upon their special characteristics, the Partner States have developed a well-established relationship with the European Union, not only in the economic and business sector, but also in the cooperation, transport and research fields. Investing in good infrastructures, developing good connectivity links with other countries, having advanced research facilities and promoting alternative energy resources are some of the examples that the Partner States have worked and progressed on. Moreover, these are fields which can be further and jointly established together with the EU.

Map 16 Geothermal fields in Iceland



Geothermal fields

- High temperature field
- Low temperature field

Bedrock

- < 0.8 m. years
- 0.8-3.3 m. years
- 3.3-15 m. years

9 - Common territorial development actions

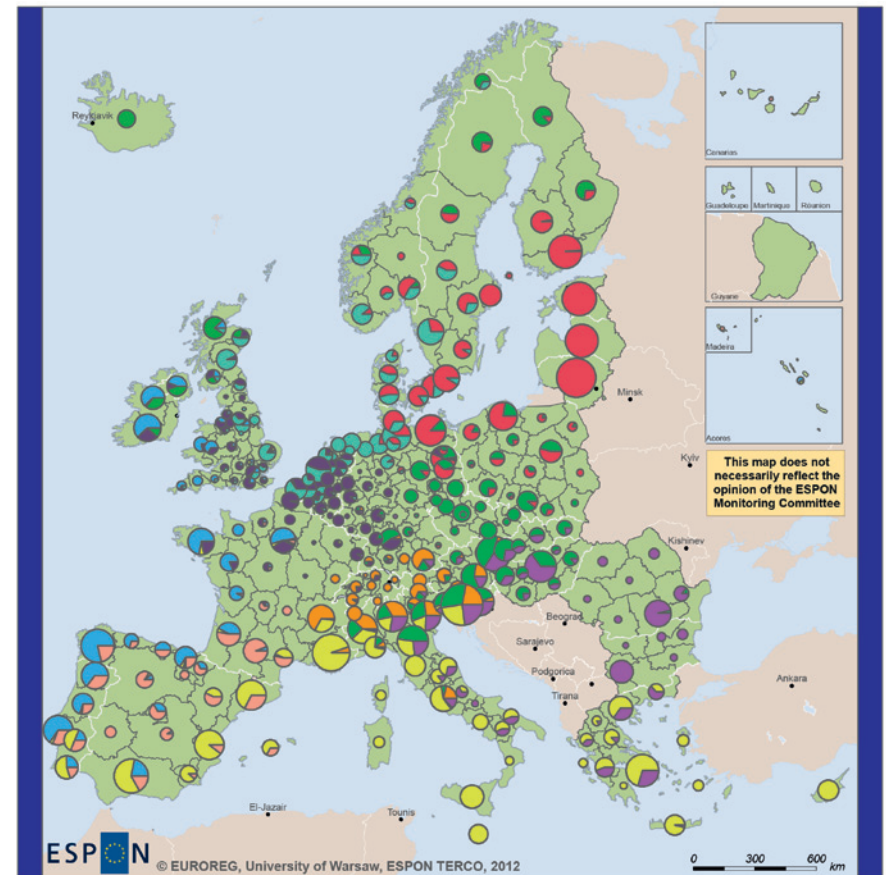
Selected key messages:

- Norway, Liechtenstein, Iceland and Switzerland demonstrate a good level of integration in terms of the different types of cooperation across Europe, including transnational territorial cooperation programmes, networking and cross border cooperation.
- Accessibility and services of general economic interest are the main topics regarding advanced cooperation between the Partner States with other countries in various cooperation strands.
- Taking the Upper Rhine as a good example of cross border cooperation we see more clearly how the relationship between the Partner States and EU Member States works. This also provides a useful illustration of the barriers to cooperating across borders and how working on several policies at once can function as an incentive for further cooperation.

Cooperation among the countries of the European territory plays an important role in decreasing disparities and achieving smart, sustainable and inclusive growth. The Partner and EU Member States cooperate on a cross-border, transnational, and macro-regional level. They share good practices, exchange information and deal with common challenges on a common basis.

EU programmes for territorial cooperation, also known as Interreg, were launched at the beginning of the 1990s in order to help foster cooperation in Europe and reduce the economic and social disparities among regions. Participation in these programmes shows the extent to which cooperation now occurs among the countries of Europe.

Map 17 Number of partners INTERREG IVB



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Regional level: NUTS 02
Source: EUROREG, University of Warsaw, 2012
Origin of data: EUROREG, University of Warsaw, 2012
© EuroGeographics Association for administrative boundaries

Legend

Number of project partners in INTERREG IVB programmes (as of January 2011)

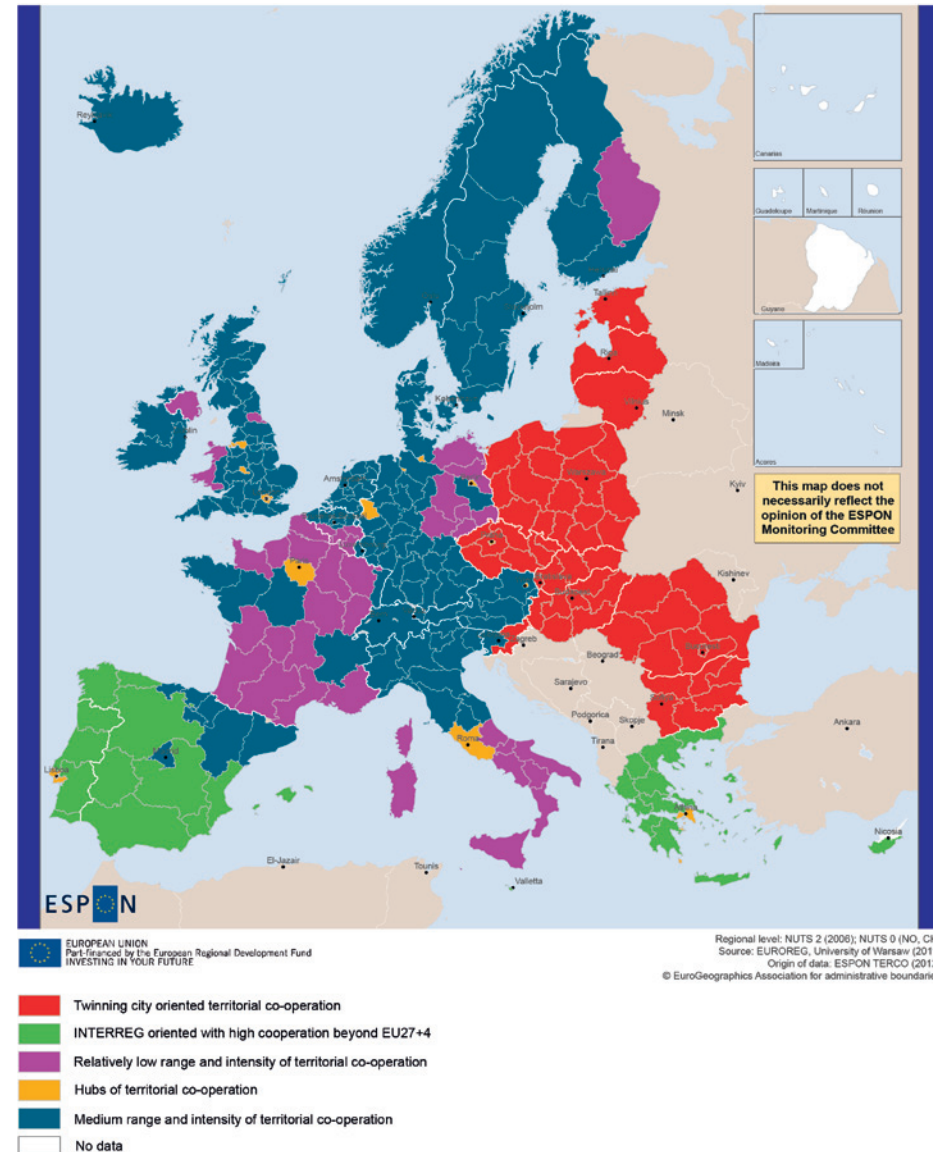


Interreg unlocks the transnational cooperation of the Partner States. Their participation in Interreg projects provides them with an initial understanding of the potential benefits of their further involvement in territorial cooperation actions. During the last programming period of 2007-2013 there were, in total, 13 transnational cooperation programmes, covering the whole territory of the European Union, including the Partner States. Map 17 focuses on how many stakeholders in a region participated in transnational territorial cooperation projects in the 2007-2013 Interreg programme period. The various programmes in which stakeholders in a region could take part are illustrated in different colours. The overall picture provided by Map 17 illustrates the level of integration of the stakeholders from the ESPON Partner States in transnational cooperation programmes and projects.

Norwegian actors are particularly strong in Interreg projects. Norway actively participates in the Interreg project portfolio, being a member in the Northern Periphery programme, the North Sea Region and the Baltic Sea Region programme. Switzerland takes part in the Alpine Space programme and the North West Europe Programme, while Liechtenstein is involved in the Alpine Space programme. Iceland only participates in one transnational programme, the Northern Periphery programme. Overall the map shows that regions in Southern Norway and Iceland in particular enjoy a good level of participation in Interreg projects, particularly when compared to the other regions of the ESPON Partner States.

Regions in Partner States cooperate with medium intensity. Cooperation in Europe does not only relate to the Interreg programmes. The typology of territorial cooperation presented in map 18 shows different types

Map 18 Territorial Cooperation in different types of regions



9 - Common territorial development actions

of cooperation regions, based on a factor and cluster analysis. A twinning city orientation applies mainly to the regions in the eastern part of Europe, stretching from the Baltic States to Romania and Bulgaria, as the red colour in map 18 shows (Type 1). Here, twinning initiatives in respect of cities, provide the prevailing type of territorial cooperation. More Interreg-oriented cooperation with a high degree of cooperation beyond the ESPON area, is to be found in the southern regions of Europe, e.g. in Greece, Portugal and most of Spain (Type 2). These countries show good overseas connections and are relatively attractive for enterprises in Europe. Regions that perform below their national average and are economically dependent on outside flows and support belong to the third type of cooperation and demonstrate a relatively low range and intensity of territorial cooperation. Such regions include Eastern Germany and Southern Italy as well as the majority of the French and Walloon regions and certain regions in the UK. Cooperation levels in this type of activity are well developed in terms of demographic and economic potentials but are on a much lower level, in terms of numbers, that 'twinning'. The fourth type, in yellow, groups regions that due to their administrative divisions were encapsulated within the large cities' boundaries. Examples of these hubs of territorial cooperation are found in regions in central Italy, France, Germany and the UK.

According to the cooperation typology presented in map 18, Iceland, Norway, Liechtenstein and Switzerland display a medium level of cooperation (type 5). The prevailing cooperation topics however often differ between the countries. For Norway cooperation linked to sparsely populated areas and accessibility issues are of importance. This can for example be seen in the Sparsely Populated Areas Strategy, the Northern Dimension and the Arctic Strategy. Iceland, as a partner

in the Northern Periphery Programme, stresses both the accessibility issue and the issue of services of general economic interest, focusing on networking and cooperation in order to improve public sector provision in sparsely populated areas, mainly through innovative service solutions. Switzerland and Liechtenstein put a strong focus on cooperation to improve and develop their transport connections and levels of accessibility.

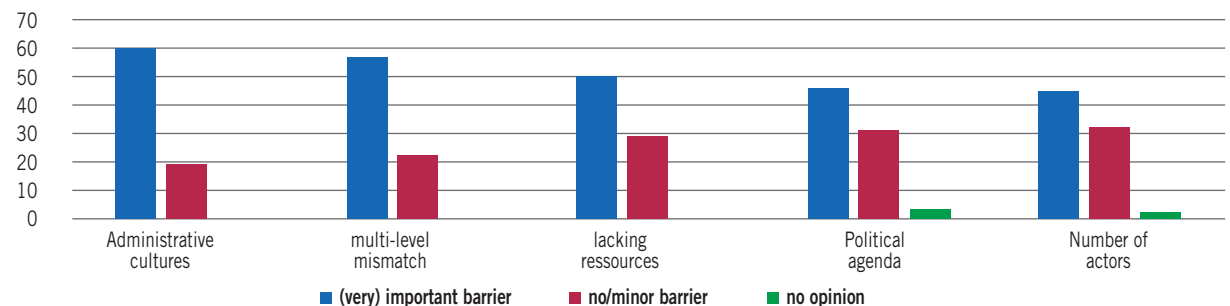
Cross-border cooperation faces barriers. Despite being well integrated across various types of cooperation the emergence of barriers to cooperation is inevitable. These can be perhaps be better observed by focusing on the regional level. The Upper Rhine cooperation between Basel in Switzerland, Alsace in France and the German States of Baden-Württemberg, Rhineland-Palatinate and Hessen illustrates these potential barriers quite well and the policy requirements in respect of cross-border cooperation that they bring to the fore. Despite the fact that there is a strong political will which supports the establishment of cross-border metropolitan projects in the Upper Rhine area, five main barriers have nevertheless been identified by regional experts. As shown in Figure 5

the most important barriers are administrative cultures, multilevel mismatch, a lack of resources, political agendas and the number of actors involved.

Administration and legal systems slow cross border cooperation. The existence of different administrative and legal systems is identified as the first, core barrier to further cooperation. An additional barrier here is the existence of different competences in respect of the cooperation partners. The competence "multilevel mismatch" deriving from differences in the allocation of political and administrative competences and structures can often make it difficult for cooperation partners to find their counterparts on the other side of the border. In addition, cultural and linguistic differences are still perceived as obstacles to further cooperation. The lack of available resources, the low level of interest afforded to the topic on the national political agenda and the limited number of actors participating in the cooperation present additional barriers here.

Transport and fare pricing policies stimulate cross-border cooperation. Despite the aforementioned

Figure 5 The five most important barriers for an enhanced cross-border cooperation



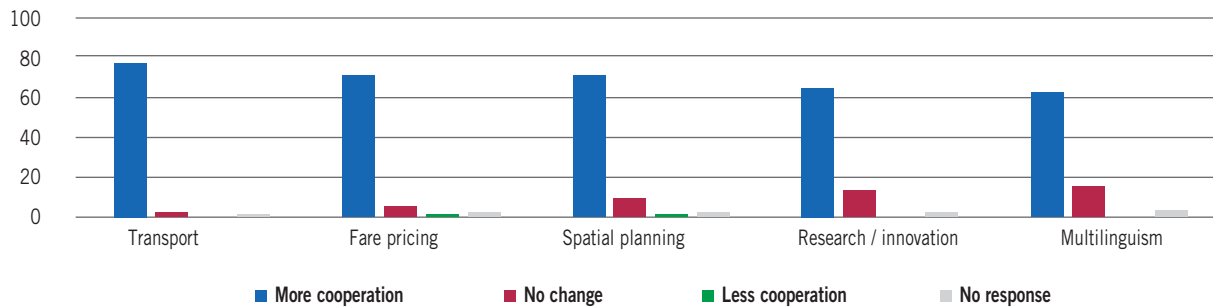
9 - Common territorial development actions

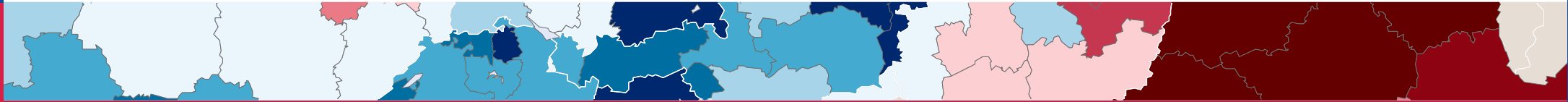
barriers, local stakeholders consider the cooperation process in the Upper Rhine to be important. The setting-up of a Tri-national Metropolitan Region is an ongoing issue in the area, although it is challenged by the persistence of administrative differences. A wide range of policies can contribute to increasing the benefits of cross-border cooperation in the area. The five main policies identified by the majority of regional experts are transport, fare pricing, spatial planning, research & innovation and multilingualism (see Figure 6).

Transport issues, especially infrastructure and tariff cooperation, are seen as the most relevant and take the first two places. Indeed transport remains a high priority topic for the region, as approximately 50,000

people cross-border commute here every day. Moreover, the location of the Upper Rhine within the European North-South traffic corridor from Rotterdam to Genoa, with its long distance traffic flows also raises interest in more transport cooperation. Further policies for future action in this metropolitan region include spatial planning, research and innovation and multilingualism, on which the three countries have already built some potential. This provides incentives and gives out positive messages for the future of European cooperation. Investing in cooperation on key policies which aim to promote infrastructure development, accessibility and innovation technologies will not only boost the growth and development of the countries in the European territory, but also create a better quality of life for its citizens.

Figure 6 The most relevant policies for increased cross-border cooperation





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The ESPON 2013 Programme is part-financed by the European Regional Development Fund, the EU Member States and the Partner States Iceland, Liechtenstein, Norway and Switzerland. It shall support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory.

ESPON shall support Cohesion Policy development with European-wide comparable information, evidence, analyses and scenarios on framework conditions for the development of regions, cities and larger territories. In doing so, it shall facilitate the mobilisation of territorial capital and development opportunities, contributing to improving European

competitiveness, to the widening and deepening of European territorial cooperation and to a sustainable and balanced development.

The Managing Authority responsible for the ESPON 2013 Programme is the Ministry of Sustainable Development and Infrastructures of Luxembourg.

ISBN: 978-2-919777-56-3