INTERREG IVB

A reviewed SWOT-analysis for North West Europe, presented according to the main objectives of the Europe 2020 Strategy and the thematic objectives of the CSF-funds regulation

Main Report:

SWOT-analysis for the smart, sustainable and inclusive growth objectives

27 May 2013

Table of contents

1. Introduction 3
2. The Europe 2020 strategy and European Territorial Cooperation 5
3. The North West Europe Territory: the challenge of managing excellence and diversity 7
4. SWOT analysis for the "Smart Growth Objective" 10
4.1. General indicators on Smart Growth 10
4.2. Additional territorial considerations of Smart Growth in NWE 17
4.3. Sectoral considerations for the Smart Growth Objective 21
4.4. Conclusions for the Smart Growth Objective 28
5. SWOT analysis for the "Sustainable Growth Objective" 31
5.1. General Indicators on Sustainable Growth 31
5.2. Additional territorial considerations of Sustainable Growth in NWE 46
5.3. Conclusions for the Sustainable Growth Objective 54
6. SWOT analysis for the Inclusive Growth Objective 57
6.1. Additional territorial considerations of Inclusive Growth in NWE 63
6.2. Conclusions for the Inclusive Growth Objective 68

1. Introduction

ERAC and Technopolis France have been assigned by the Interreg IVB North West Europe (NWE) programme to provide assistance in the drafting of the Operational Programme for the 2014-2020 programming period (Interreg VB NWE). As part of this assignment the drafter consortium has carried out a review of the preliminary SWOT prepared by EURE CONSULT S.A. at the request of the Programme Preparation Group (PPG). This work is meant to provide the necessary basis for the identification of key needs and priorities to be addressed by the future programme, as well as to draw a baseline for the indicators and objectives to be adopted for the 2014-2020 period. The reviewed SWOT shall also provide the basis for the sound definition for the Interreg VB programme strategy.

The following SWOT seeks to offers an overview of the NWE area along with its major strengths and weaknesses; it identifies the specificities and commonalities of the territory (identity), and defines the key areas where the implementation of transnational cooperation would generate high additionally.

The reviewed SWOT was built on the basis of two existing documents:

- Analysis of data & policy context of NWE (Bureau Buiten, September 2012)
- Provisional SWOT analysis for NWE presented according to the main objectives of the Europe 2020 strategy and the thematic objectives of the CSF funds regulation (EureConsult S.A., September 2012)

Due to the fact that both of these documents were drafted simultaneously, the current document set out to integrate the main elements contained in both into a single SWOT. An additional layer of information was then added by the OP drafters, based on two elements:

- The request expressed on behalf of the programme's joint technical secretariat (JTS) to increase the territorial dimension of the analysis
- The work carried out by the PPG (e.g. identification of preliminary Thematic Objectives and Investment Priorities for the programme) and positions adopted by participating Member States (e.g. U.K. position paper on how to integrate the 'inclusive' Thematic Objective into the Operational Programme).

Specific attention was given by the drafters to enriching the SWOT of the 'smart' growth objective in order to add a sectoral dimension which was missing from the preliminary SWOT. In doing so, they relied upon the Regional Innovation Monitor platform, and the European Cluster Observatory.

The document follows the general structure adopted by the provisional SWOT carried out by EURE CONSULT SA. An individual section and SWOT table is presented for each of the three overarching objectives of the Europe 2020 Strategy. The 11 thematic objectives as mentioned under Article 9 of the Commission's proposal for the CSF Funds regulation have been regrouped under each of these three objectives as follows:

- The strategic objective of "smart growth" under Europe 2020 is primarily related to the thematic objectives no. 1, 2 & 3[1] which are raised under Article 9 of the CSF and ETC regulations.
- The strategic objective of "sustainable growth" under Europe 2020 is primarily related to the thematic objectives no. 4-7 which are raised under Article 9 of the CSF and ETC regulations.
- The strategic objective of "inclusive growth" under Europe 2020 is primarily related to the thematic objectives no. 8, 9 & 10[2] which are raised under Article 9 of the CSF and ETC regulations.
- The horizontal objective of "stronger governance", which also forms part of the Europe 2020 Strategy, is primarily related to the thematic objective "enhancing institutional capacity & an

[1] As opposed to the provisional SWOT, this document has placed Thematic Objective 3 (Enhancing the competitiveness of small and medium-sized enterprises) under the 'Smart Growth' objective, rather that 'Sustainable Growth' objective in order to improve clarity and coherence. It is worth highlighting however that the Europe 2020 strategy places competitiveness and the flagship initiative on "an industrial policy for the globalisation era" under the 'Sustainable Growth' objective..

[2] As opposed to the provisional SWOT which places objective 10 under the 'Smart' and 'Inclusive' growth objectives, this document has placed it exclusively under the latter in order to improve clarity and coherence of the SWOT. It is important to highlight that under current draft legislation for the future programming period, Thematic Objective 10 covers both of the EU 2020 objectives.

efficient public administration" which is raised as theme 11 under Article 9 of the CSF and ETC regulations

Within each of the objective-specific SWOT-analyses, the related themes for thematic programme objectives were kept as an "orientation point" in order to ease an orientation.

In addition to the provisional SWOT, the OP drafters have also added a subsection on territorial the territorial considerations for two of the Europe 2020 general objectives (smart growth and sustainable growth). These subsections generally make use of the data identified by a set of ESPON projects (e.g. KIT, Climate, Transmec), by the Regional Innovation Platform (RIM)[3] and the European Cluster Observatory in order to facilitate the sound selection of Thematic Objectives and Investment Priorities for the future Operational Programme.

All in all, the review of the SWOT analysis carried out by the OP drafter team sought to provide a more detailed picture of the diversity existing within the territories within the NWE area. This diversity must be taken into account when identifying Thematic Objectives, investment priorities and priority actions for the future NWE VB programme.

[3] RIM platform is a DG Entreprise funded project run by Technopolis Group on the monitoring of the Regional Innovation Strategies in the EU regions.

2. The Europe 2020 strategy and European Territorial Cooperation

The Europe 2020 Strategy[4] promotes the strategic objectives of a smart, sustainable and inclusive growth which are made further operational by a number of "headline targets for 2020" and by seven "flagship initiatives". The Europe 2020 Strategy has important direct implications for the future EU Cohesion Policy, because it develops - in fact - the same "directing effect" on the thematic focus of the Cohesion Policy programmes for the period 2014-2020 as had the previously adopted and successively revised Lisbon Strategy for the Structural Funds programming period 2007-2013. This becomes not only evident from the Europe 2020 Strategy itself,[5] but also from the 11 thematic objectives mentioned under Article 9 of the Commission's proposal for the "CSF Funds regulation" and from the concentration provisions of Article 5 in the draft regulation for European Territorial Cooperation.[6]

However, this directing effect of **Europe 2020** is not unproblematic because the strategy **is in territorial terms largely unspecific.** It mentions territorial cohesion together with economic and social cohesion only incidentally, although it claims that these objectives (…) *remain at the heart of the Europe 2020 Strategy to ensure that all energies and capacities are mobilised and focused on the pursuit of the strategy's priorities.*[7] A report prepared at the request of the Polish Presidency of the Council of the European Union[8] affirms this general criticism and points to the likely side-effects which can result out of this. The report clearly states that the Europe 2020 Strategy (…) *does not take into account the issue of territorial determinants. As such it underestimates the potential of, and the need for, a territorially differentiated policy and its implementation to achieve the far-reaching aims of smart, sustainable and inclusive growth. One of the main reasons for this is that the role of the territorial cohesion objective in the EU development support system remains unclear.*[9] Furthermore, they express their concerns about the likely negative side effects that could result from a "territorially blind" implementation of ''Europe 2020', especially in the event that the type of growth ultimately generated turns out to be "smarter" rather than "sustainable" and "inclusive". Moreover, they also highlight that (…) *"smart, sustainable and inclusive growth can only be attained if policy making takes into account the territorial diversity of development potentials and challenges within Europe. To avoid 'Europe 2020' simply reproducing the Lisbon strategy failure, due attention must be paid to the territorial dimension of, and potential for, smart, sustainable and inclusive growth".*[10]

This, of course, **can give raise to a challenge in terms of policy choice** which has to be addressed during the elaboration process of the North West Europe (NWE) programme for the period 2014-2020. The overall focus of Europe 2020 and the concentration on a limited number of the Article 9 thematic objectives might indeed lead to a situation in which some specific aspects which are of strategic relevance for the territorial development of the transnational cooperation area can remain unaddressed or at least receive insufficient attention by the future programme strategy. But also a more operational challenge can occur when it comes to translating the chosen thematic objectives into concrete interventions and operations. Due to the requirement that future interventions have now to be described in more detail, it must be carefully examined already during the programming process whether the respective target groups addressed by the chosen Europe 2020 themes can actually be interested in and also mobilised for transnational cooperation (e.g. NGOs, private and intermediary or third-sector organisations etc.).

---

[4] Commission of the European Communities (2010): EUROPE 2020 - A strategy for smart, sustainable and inclusive growth. Communication from the Commission, COM 2010(2020) final. Brussels.

[5] Commission of the European Communities (2010): EUROPE 2020 op. cit., p.20: Here, it is clearly stated: *Cohesion policy and its structural funds, while important in their own right, are key delivery mechanisms to achieve the priorities of smart, sustainable and inclusive growth in Member States and regions.*

[6] ETC Draft Regulation, Article 5 on "Thematic Concentration": *The thematic objectives referred to in Article 9 of Regulation* (…) *shall be concentrated as follows: (a) up to 4 thematic objectives shall be selected for each cross-border cooperation programme; (b) up to 4 thematic objectives shall be selected for each transnational cooperation programme; (c) all thematic objectives may be selected for interregional cooperation programmes pursuant to Article 2(3)(a).*

[7] Commission of the European Communities (2010): EUROPE 2020 op. cit., p.20

[8] Böhme K., Doucet P., Komornicki T., Zaucha J., Świątek D. (2011): How to strengthen the territorial dimension of 'Europe 2020' and EU Cohesion. Policy. Warsaw.

[9] Böhme et. al., op.cit: p.65

[10] Böhme et. al., op.cit: p.16

Although the proposal for the ETC-goal related regulation offers already some general "solutions" for these eventually emerging challenges (**see: box 1 below**), we consider it important that the NWE countries are provided with a comprehensive SWOT-analysis so that they dispose of a solid basis for subsequently deciding the precise policy focus of the programme strategy for the period 2014-2020. **The policy focus can in principle be either holistic** (i.e. by addressing specific thematic objectives that are related to each of the three EU 2020 objectives) **or thematically more focussed** (i.e. by addressing specific thematic objectives that are related to only one or two of the EU 2020 objectives).

Box 1:
Future ETC programmes and their relation to the "Europe 2020 Strategy"

(17) In order to deliver on the targets and objectives of smart, sustainable and inclusive growth set out in the Europe 2020 strategy, the ERDF should contribute under the European territorial cooperation goal to the thematic objectives of developing an economy based on knowledge, research and innovation, promoting a greener, more resource-efficient and competitive economy, fostering high employment that delivers social and territorial cohesion, and developing administrative capacity. However, the list of the investment priorities under the different thematic objectives should be adapted to the specific needs of the European territorial cooperation goal, in particular by allowing for the continuation under cross-border cooperation of legal and administrative cooperation and cooperation between citizens and institutions, of cooperation in the fields of employment, training and social inclusion in a cross-border perspective, by allowing for the continuation under transnational cooperation of maritime cross-border cooperation not covered by cross-border cooperation programmes, and by the development and implementation of macro-regional and sea basin strategies.

(18) It is necessary to adapt the content requirements of cooperation programmes under the European territorial cooperation goal to their specific needs. Therefore they also need to cover aspects necessary for effective implementation on the territory of participating Member States, such as the bodies responsible for audit and control, the procedure to set up a joint secretariat, and the allocation of liabilities in case of financial corrections. In addition, due to the horizontal character of interregional cooperation programmes, the content of such cooperation programmes should be adapted, especially as regards the definition of the beneficiary or beneficiaries under the current INTERACT and ESPON programmes.

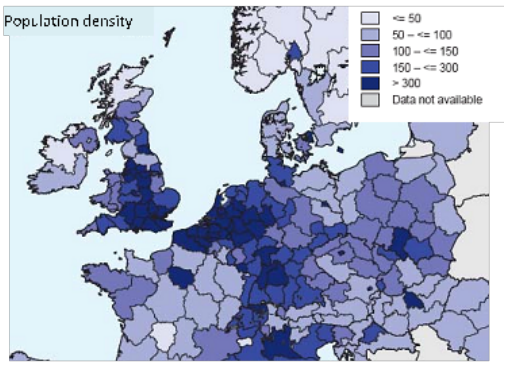
Source: Proposal for a regulation on specific provisions for the support from the European Regional Development Fund to the European territorial cooperation goal.

3. *The North West Europe Territory: the challenge of managing excellence and diversity*

The NWE territory can be characterised as the powerhouse of Europe. Home of the famous blue banana, the area hosts an impressively high number of Europe's leading territories in terms of economic performance and growth. The programme area of NWE comprises a number of the main metropolitan areas in Europe, which play an important role in a worldwide perspective (e.g. London and Paris). Yet, the general perception of NWE as being highly dynamic, hides another more complex system of territorial, economic and social dynamics. Indeed, it may come as a surprise to many that NWE is characterised by high levels of heterogeneity among its regions in light of an important number of performance indicators. Further, many of these differences seem to be increasing with time. As a result, one of the main challenges for the NWE transnational cooperation area is to manage excellence and diversity at once.

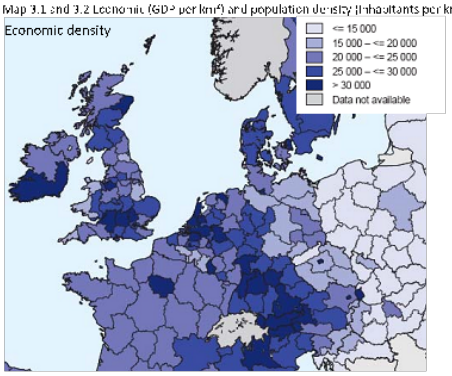
> *"While Northwest Europe is still characterised by a densely populated core, with good accessibility and high economic performance, over the past years regional disparities between some countries (e.g. between Ireland and Germany) have become more pronounced. Also between regions, including those in the same country, there seem to be increasing disparities, both in terms of spatial development trends, as well as in terms of proposed policy responses." – NWE data analysis (Bureau Buiten)*

NWE is the most densely populated area in Europe with about 240 million inhabitants in 2011 for the NWE countries (UN, 2011). Economic activity is highly concentrated in the urban areas in the UK (Southern: London, Portsmouth, Nottingham, Bristol, Luton, Southampton, Leicester, Birmingham; Middle and Northern: Glasgow City, Edinburgh, Belfast, Liverpool, Manchester), The Netherlands (the Randstad region with Amsterdam, The Hague, Delft, Leiden, Utrecht and Rotterdam), Belgium (Brussels, Antwerp), Germany (Frankfurt, Düsseldorf, Stuttgart, Nurnberg, Essen, Mannheim, Köln) and France (Paris and Île de France). Adjacent to the densest NWE-areas, high population concentrations can be found in Munich, Hamburg, Berlin, Copenhagen and Vienna[11].



Source: Eurostat, 2011

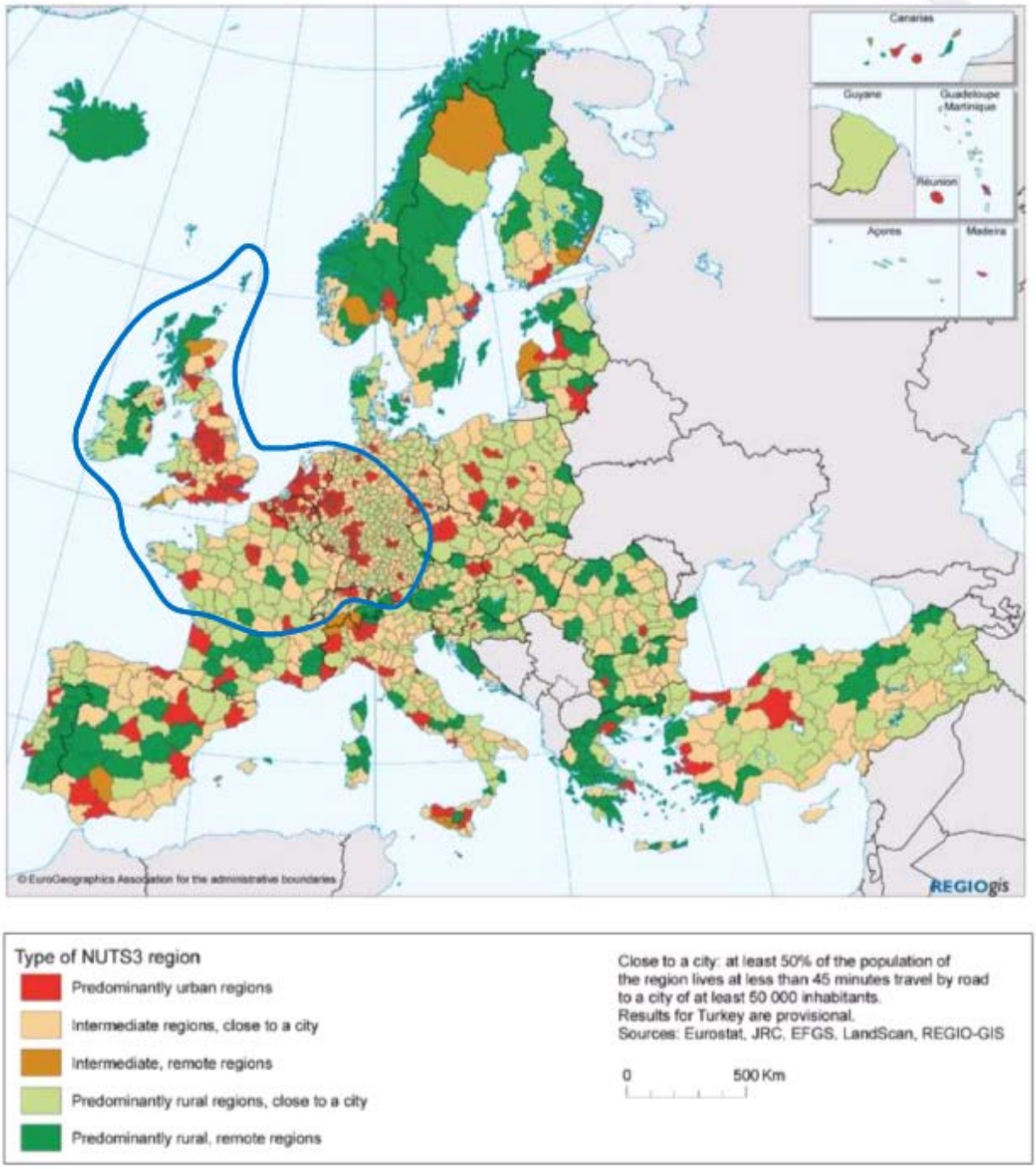
Map 3.1 and 3.2 Economic (GDP per km²) and population density (inhabitants per km²)



The programme area of North West Europe comprises a number of the main metropolitan areas in Europe, which even play an important role in a worldwide perspective. Besides the global cities of London and Paris, major urban agglomerations stretch throughout North West Europe from Dublin and Greater Manchester, via London, large parts of Belgium and the Netherlands, major agglomerations areas along Ruhr and Rhine in Germany further to Switzerland. Indeed, **North West Europe is more than other transnational cooperation areas characterised by a high degree of urbanisation, with many larger cities in close proximity**. Furthermore, there are a large number of secondary growth poles. The **high level of urbanity is both strength and in particular in environmental terms also a challenge for the programme area**.

[11] Bureau Buiten, Analysis of Data & Policy Context NWE

MAP 6 – Urban-rural typology of NUTS3 regions including remoteness (DG Regio) for the TNC North West Europe



In spite of this, the NWE area comprises a number of regions characterised as rural areas in close proximity and rural regions of more remote character. As illustrated by the following map, there is a divide between the stretch of agglomerations largely describing the Blue Banana and more rural characteristics of large parts of the remaining programme area.

The urban/rural divide within NWE also affects the levels of accessibility of its regions. On the one hand, the urban density of the territory is one of the factors explaining the area's overall high accessibility, both in terms of multimodal accessibility and possibilities for one-day business trips. On the other hand, more isolated rural regions have considerably less favourable accessibility, and in some cases are below the European average.

The following table provides the main conclusions of the ESPON TERREVI[12] project regarding the performance of the NWE on a number of indicators under the Smart, Sustainable, and Inclusive objectives of the Europe 2020 strategy. For all of these indicators, the NWE area is either above the European median value, or at the same level (green or yellow on the traffic light). However, the table also shows that in all but three of these indicators, the disparities in the NWE area are high.

	Total Intramural R&D Expenditure (GERD). Percentage of the GDP (2009)			Employment in knowledge-intensive services as percentage of total employment (2010)			Percentage of individuals regularly using internet (2011)		
	disparities in the TNC Area	median value of the TNC Area	median value of EU-27+4	disparities in the TNC Area	median value of the TNC Area	median value of EU-27+4	disparities in the TNC Area	median value of the TNC Area	median value of EU-27+4
SMART GROWTH	*high*	1.6	1.2	*low*	44.8	39.0	*low*	79.0	71.0
	Wind energy potential			**Ozone concentration**			**Potential vulnerability to climate change**		
SUSTAINABLE GROWTH	*high*	78775	73939	*high*	8.1	8.6	*high*	0.1	0.1
	Long-term unemployment rate (12 months and more) - 2011			**At-risk-of-poverty rate - 2011**			**Persons aged 25-64 and 20-24 with upper secondary or tertiary education attainment (%) - 2011**		
INCLUSIVE GROWTH	*high*	2.3	3.0	*high*	15.7	15.7	*low*	74.8	76.4

Regional level of analysis: NUTS 2 (except for Potential vulnerability to climate change - NUTS 3)
Thresholds for detecting disparities using the variation coefficient: low ≤ 15%, medium 15 - 30%, high ≥ 30%
Origin of data: EUROSTAT 2012, ESPON ReRisk, ESPON INTERCO & ESPON Climate Projects

Source: ESPON Factsheet

With regard to its **geographic specificities**, the programme area comprises in a European perspective, mainly the **coastal areas along the channel**, as well as mountainous areas mainly towards the Alps and in the UK.[13]

[12] The ESPON TERREVI project produced evidence for Structural Funds programmes with the aim to support the development of the programmes to be carried out in the 2014-2020 period. One milestone of this work consisted in presenting selected ESPON research pieces in easy-to-understand factsheets for all territorial cooperation programme areas.

[13] Espon TERREVI project, Factsheet for the Nort West Europe Transnational Cooperation Area

4. SWOT analysis for the "Smart Growth Objective"

For the European Union to remain globally competitive in a medium- and long-term perspective, it is of utmost importance that the EU economy further increases its productivity and quality by drawing on its technological strengths and its ability to compete in products and services with high knowledge content.

The Europe 2020 Strategy addresses this strategic need by the smart growth objective, which means that strengthening knowledge and innovation as drivers of future growth (…) *requires improving the quality of our education, strengthening our research performance, promoting innovation and knowledge transfer throughout the Union, making full use of information and communication technologies and ensuring that innovative ideas can be turned into new products and services that create growth, quality jobs and help address European and global societal challenges. But, to succeed, this must be combined with entrepreneurship, finance, and a focus on user needs and market opportunities.*[14]

Looking at the indicators for smart growth, the North West Europe are has a general better performance than the EU27+4 space. Considering the objective of R&D expenditure of 3 percent of the GDP – one of the five headline targets in the Europe 2020 Strategy - the TNC area performs better than the EU27+4 space with a high level of disparity due to significant internal differences. Regarding employment, considering the ratio of the employment in knowledge-intensive service to the total employment in 2010, the TNC area has a better performance than the EU27+4 space. The internal distribution results in a low level of internal disparity. Considering the percentage of individuals regularly using internet in 2011, the TNC area has a better performance than the EU27+4 space, with a low level of internal disparity.

4.1. General indicators on Smart Growth

R&D and Innovation

Most NWE countries come close to the Europe 2020 target of spending 3% of their GDP on activities in the area of research and development, but in a global perspective this R&D spending still remains behind the R&D expenditure of most of their main competitors.[15] In their respective National Reform Programme, Luxembourg, Ireland and the Netherlands have set their targets below the EU target due to their more service oriented economy, while Germany is the most ambitious of the NWE countries and set a target of 10%.

Assessing the current state of play in terms of R&D and innovation within NWE only at the Member State level is not appropriate, because of the strong bias created especially the country-wide inclusion of Germany and France (both are only partly covered by the cooperation area). Therefore, a limited number of core indicators were selected among the many existing indicators[16] in order to better highlight the considerable territorial disparities that do exist in NWE co-operation with respect to R&D and innovation:

The **R&D expenditure across all sectors** is in NWE highly focussed on some regions, which can be illustrated by looking at the most recent figures for the regional R&D intensity. They show that 10 NUTS 2 level regions in NWE have actually surpassed the European target value of 3%,[17] which represents nearby half of all EU regions (in total 24) that fall into this category. Another 14 NWE

[14] Commission of the European Communities (2010): EUROPE 2020 op. cit., pp.9-10.

[15] In 2008, the R&D expenditure was in Japan 3.45 %, in South Korea 3.36 % and in the United States 2.79 %), while in the leading NWE countries it was 2.82 % (Germany) and 2.26 % (France). Eurostat (2012): Science, technology and innovation in Europe (Pocketbook, 2012 edition).

[16] i.e. the overall and sector-specific levels of R&D expenditure as % of GDP, the stocks of knowledge workers and of personnel employed in R&D/technology, the overall and sector-specific patenting activity, the aggregated regional innovation performance and the aggregated regional innovation potential.

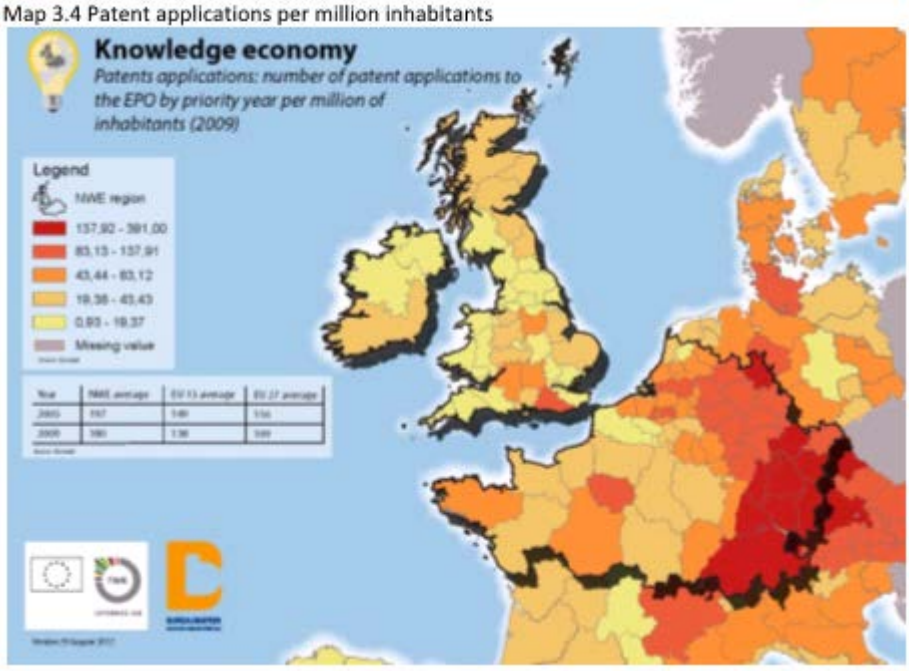
[17] i.e. Aberdeen and Aberdeenshire; Cheshire West and Chester; Berkshire, Buckinghamshire and Oxfordshire; Essex; East Anglia; Ile-de-France; Tübingen; Stuttgart; Karlsruhe; Darmstadt.

regions located in the UK, Belgium, the Netherlands and Germany, but also the whole of Switzerland, are quite close to this target (2-3%), while all the other NWE regions are either behind (< 2%) or even considerably behind this target (< 1%).

A relatively similar picture appears in NWE for **the share researchers employed in all sectors**, but here the regions being above the EU27 average are geographically even more concentrated on the continental part (however with a stronger position of Luxembourg and the Brussels capital region) and more widespread in the UK. If one looks at the **human resources in science and technology by virtue of occupation (HRSTO)**[18], however, then it becomes clear that especially the continental part of NWE is in a relatively favourable position: With the exception of the regions Picardie and Champagne Ardennes, all other continental NWE regions have shares that are around or above or even significantly above (Switzerland, south-west Germany, larger parts of the Netherlands, Ile-de-France) the EU27 average. In Ireland and the UK, however, several regions in England and punctually also in Scotland have shares around or above the EU27 average but not significantly above, whereas in the rest the level is below the EU27 average.

The **number of patents** is an often-used indicator on innovation output. To get a picture on how innovative a region is, the number of patents in a region is divided by the number of inhabitants (per million inhabitants). With 168 patents per inhabitant in 2010 (see figure 3.2), the NWE-area performs far above the EU15 average of 122. Again, as for R&D-intensity, the innovation output (patent applications) is the highest in Switzerland and Germany. At regional level (see map 3.4), high concentrations of patents can be found in German high tech regions, more specifically in and around Stuttgart and Munich and a dispersion further into West-Germany.[19]

Map 3.4 Patent applications per million inhabitants



If one looks more specifically at the **employment in high-tech sectors**, then one can observe that NWE holds a generally strong position in this segment which is a key driver of economic growth, productivity and welfare and in general a source of high value added and well-paid employment in the EU. Out of the EU-top 20 regions in terms of high-tech employment, 9 are located in the NWE. The leading region was Berkshire/Buckinghamshire/Oxfordshire (UK) with high-tech sectors accounting for 11.5% of total employment, followed by Ile-de-France with 8.9 %. The other seven NWE regions range between 7.6% (Karlsruhe) and 4.7% (Düsseldorf). In most of these nine top regions, however,

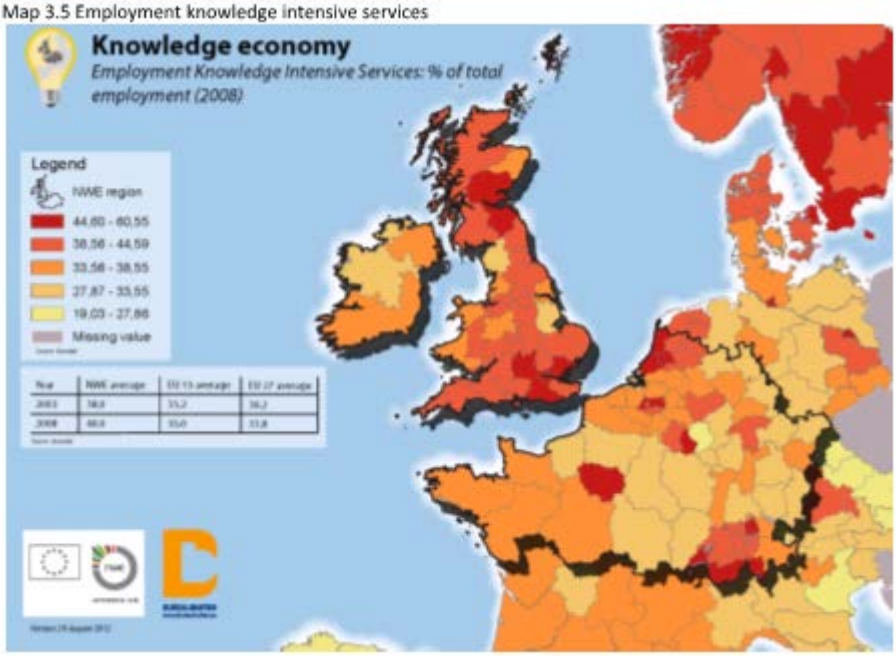
[18] The HRST population takes into account a much larger share of knowledge workers and also includes, for example, qualified persons working in non-R&D activities and suitably qualified former R&D personnel who are unemployed, retired or otherwise out of the labour force. HRSTO is the sub-group of HRST most suitable for comparing HRST with R&D personnel.

[19] Bureau Buiten, Analysis of Data & Policy Context NWE

the annual average growth rate of employment in high-tech sectors fell in the years from 2001 to 2006 (i.e. Berkshire/Buckinghamshire/Oxfordshire, Ile-de-France, Karlsruhe, Southern and Eastern Ireland, Darmstadt, Outer London, Stuttgart), while the other two were characterised by a moderate positive growth (Düsseldorf: 1.5%) or even a strong positive growth (Köln: 4.2%).[20] For 2008, a map-based representation shows that many NWE regions have employment levels above the EU27 average and that the regions with significantly above-average levels are mostly found in Ireland (whole country), in the South-East of England and around the capital cities in France, Belgium and the Netherlands (in addition also in south) and in several regions of the involved German Länder North Rhine Westphalia, Hessen and Baden-Württemberg as well as in Saarland as a whole.

The knowledge economy is more than 'just' a scientific (R&D) based economy. The geography of knowledge and innovation is complex. To get a more nuanced picture, map 3.5 shows the dispersion of employment in Knowledge Intensive Services (KIS). This results in a quite different view with high concentrations in city regions in and around London, Edinburgh/Glasgow, Zürich, the Randstad area in the Netherlands, Brussels, Luxembourg, and Paris. These 'knowledge regions' are more based on trade of products and supporting services (instead of production in high tech industries) with large numbers of incremental and marketing innovations (instead of (radical) product innovations), often not captured in patent application data[21].

Map 3.5 Employment knowledge intensive services



Information & communication technologies

The territorial dimension of the Information Society in NWE can be assessed by using a broader concept of "digital divide"[22] which now looks not only at the access of citizens and enterprises to ICT as a basic pre-condition for their effective participation in the Information Society (i.e. the presence of electronic devices, such as computers, and internet connections) but also at the related skills that are needed to take part in the Information Society (i.e. the difference in participation according to gender, age, education, income, social groups or geographic location).

[20] Eurostat (2009): Science, technology and innovation in Europe. Statistical books, edition 2009.

[21] Bureau Buiten, Analysis of Data & Policy Context NWE

[22] At an early stage, the concept of digital divide was mostly focussing on examining the level of accessibility to the internet and internet consumption. This "first-level digital divide" mainly refers to the distinction between those who have internet access and are able to make use of new services offered on the World Wide Web, and those who are excluded from these services. As more and more persons are gaining access to the internet, the concept's focus was further widened and now also examines the so-called "second-level digital divide". This perspective aims to uncover factors that prevent or facilitate the participation in the internet, examines how people use the internet to find information or to create content (differences in people's on-line skills) and explores how to make the internet more relevant and approachable to include different groups in the digital (i.e. What separates the consumers of content on the internet from the web content producers?).

Looking at the **digital divide in a world-wide perspective**, one can see that the overall Information Society development in the EU27 is clearly lagging behind its main industrial partners. The main reasons explaining this situation are the fragmented digital markets (i.e. the EU is still a patchwork of national online markets), the lack of interoperability, the still low trust in networks due to rising cyber crime, the lack of investment in networks, insufficient research and innovation efforts, a lack of digital literacy and skills and missed opportunities in addressing societal challenges.[23] This lagging behind position can also be illustrated by taking a look at the overall ability of individuals in a country to access and use ICT: only a part of the EU27 belongs to the top 20 world-wide leading countries, but among them one can find nearby all NWE countries (except France & Ireland). In the top 10 group only the Netherlands stand out with a 6th rank position,[24] while the remaining NWE countries are all belonging to the follower group of the world-wide leading countries ranking between position 11 to 20.[25]

For NWE, the most important territorial features of **the Information Society development status in 2009** can be summarised as follows. With respect to the "share of households connected to broadband" and the "non-usage of internet" in 2009, two inversely related overall pictures appear: The share of households connected to broadband was, with the exception of the Irish Border, Midland and Western region and larger parts of France (excluding Ile-de France) as well as some provinces in the Walloon region, above 50% in all other NWE-areas. However, regions in which more than 75% of the households have a broadband connection can only be found in the UK and in the Netherlands. The share of the population never having used the internet is in general lowest (< 25%) in those NWE-regions with a high level of household broadband connection (UK, Netherlands, Luxembourg, Germany, larger parts of Belgium), whereas much higher population shares never having used the internet can be found in France (Nord Pas-de-Calais and Brittany even 35-45%) and in Ireland (the Border, Midland and Western region even 35-45%) as well as in some provinces of the Walloon region.

If a look is taken at **the evolution of the NWE Information Society during the economic crisis period 2008-2010**, however, then one can observe across these three indicators (i.e. broadband connections, usage of internet, e-commerce) that the most dynamic development has first and foremost taken place in those NWE-regions which were generally lagging behind in the 2009 situation analysis (esp. in Ireland, France, Belgium). But also in many other NWE regions the Information Society continues to develop further, albeit often at a somewhat slower path. This suggests that "catch-up-processes" are underway in the NWE countries and regions still lagging behind, which represent an opportunity for slowly closing the digital divide in the transnational area in a medium-term perspective.

The **shares of persons having computer and internet skills (low, medium, high)** is in nearby all NWE countries clearly above the EU27 average in 2011 (except Ireland, being slightly below or at the EU average). However, one should not neglect the somewhat more nuanced regional-level picture which appears if one looks at the variable levels of computer skills.

The percentage of individuals with medium or **internet skills in NWE** is far above the EU27-average (42%, see figure 3.3) and is growing continuously (see figure 3.4). The Netherlands scores outstanding, on both broadband access (see also map 3.7) and internet skills. Outside the NWE, especially the Scandinavian and Baltic countries are notable on both indicators.

The percentage of **individuals who order goods or services over the internet** for private use is growing rapidly. In the EU27-countries in 2004, only 20% of the individuals acquired purchases online against 42% in 2011 (see figure 3.5). In the UK, the Netherlands, Germany and Luxembourg, this percentage is much higher (between 65% and 70%) and in Belgium and Ireland (43%) much lower. France ranks in be- tween with 53%.

[23] Commission of the European Communities (2010): A Digital Agenda for Europe. Communication COM(2010) 245 final/2.
[24] i.e. after Sweden, Denmark, Iceland, South Korea and Norway, but before Hong Kong, Finland, Taiwan and Canada
[25] i.e. UK (rank 12), Switzerland (rank 13), Luxembourg (rank 15), Germany (rank 18), Belgium (rank 20).

In terms of spatial effects, such shifts in retail behaviour can also be expected to have implications for the vitality and viability of many city centres.

The number of **patents applications in the ICT sector** gives information on where innovations in ICT take place. The Netherlands scores high on the number of patents per million inhabitants, together with Switzerland and Germany (see figure 3.6). The other NWE-countries follow at a distance. Between 2005 and 2008 innovation out- put has decreased a bit.

Outside the NWE-area, Sweden and Finland rank high on this indicator. This is in line with the R&D-intensity in ICT of these countries (EC 2012b). Within the Netherlands, the Noord-Brabant region scores very high on ICT patent applications (see map 3.9). Within Germany the regions Mittelfranken and the Stuttgart-area have high levels of patent applications.

Competitiveness of businesses, particularly in manufacturing and within SMEs

The financial and economic crisis has underlined the need that the EU-economy has to become more competitive and also more sustainable by achieving the transition to a low-carbon and resource-efficient economy. Within the new growth model of the Europe 2020 Strategy, a renewed approach to industrial policy is promoted to put the EU economy on a dynamic growth path strengthening EU competitiveness, providing growth and jobs. This is at the very heart of the flagship initiative "an industrial policy for the globalisation era", which aims to achieve a strong, competitive and diversified world-class industrial manufacturing value chain for securing the EU's competitiveness and to underpin the recovery of growth and jobs. In this view, it is essential to increase productivity in manufacturing industry and associated services and in particular to unlocking the economic growth and job creation potential of small and medium-sized enterprises (SMEs) which currently account for more than 67% of private sector jobs and provide more than 58% of the total turnover in the EU. [26]

When **looking at competitiveness** first, one has to observe that it has a strong territorial dimension in the EU and is also driven by more factors than only firm-related productivity (e.g. also by factors such societal well-being and long-term potentials). This complexity is captured by the European Commission's new Regional Competitiveness Index, which reveals a number of interesting features within NWE:

- Nearby half of the **NWE regions** belong to the group **with the highest competitiveness levels** in the EU27 (> 75) that are also significantly above the EU27 average (55). Among them are those regions which host a knowledge-intensive economy capable of producing new technologies and where the growth process depends upon R&D/innovation as well as on the accumulation of human capital (i.e. the South of England and parts of Scotland, the Netherlands, Luxembourg, Flanders, Ile-de-France, south-west and north-west of Germany),[27] but also some other NWE regions catching up on these strong innovation generating regions through a process of technology absorption which requires high levels of human capital (i.e. Southern and Eastern Ireland, several regions in the middle and north of England, West Flanders).[28]
- A larger number of other **NWE regions** are still above the EU27 average and have **a medium-high competitiveness level.** This group includes – from a more R&D/innovation focussed view - some of the NWE-regions being strong generators of innovation (Walloon province of Liège, Alsace) and a larger number of the good innovation performers (i.e. Wales, Northern Ireland, North-West of England, Bretagne, Flemish province of Limburg, all other German regions).
- Finally, there are several **NWE-regions with a medium or medium-low competitiveness level,** because they are either slightly above or below the EU27 average. They include regions with a good innovation performers (i.e. Border-Midland-Western Ireland, some parts of northern England and northern Scotland, most regions in France, southern provinces of the

[26] European Commission (2010): An Integrated Industrial Policy for the Globalisation Era Putting Competitiveness and Sustainability at Centre Stage. Communication SEC(2010) 1272, SEC(2010) 1276.
[27] i.e. the "strong generators of innovation" identified by the synthetic indicator on regional innovation potential developed by DG REGIO.
[28] i.e. the "good innovation performers" identified by the synthetic indicator on regional innovation potential developed by DG REGIO.

Walloon region), but also the regions with are weak absorbers or diffusers of innovation (upper part of North-West England & extreme west of South England, Basse-Normandie, Haute-Normandie, Picardie, Bourgogne).

Improving the competitiveness of SMEs and unlocking their full growth potential in NWE means in general that the different factors which still limit the creation and growth of SMEs are better addressed.[29] This has indeed to be done by horizontal and sector policies at the EU and national levels, but also by differentiated and well-targeted regional policies which take into account the above-mentioned territory-specific situations of competitiveness. This is of particular relevance for NWE, where SMEs from the non-financial business economy play an important role in terms of employment and value added.

- If one compares for 2008 the respective **shares of SMEs and larger enterprises in the total employment of the non-financial business economy** in NWE countries (no data for France), then the SMEs in Luxembourg stand out with a share higher than 75% which is also significantly above the EU27 average of 67%. In several other NWE countries, SMEs still have shares slightly above the EU27 average (Ireland, Belgium) or slightly below the average (Netherlands, Germany), whereas in the UK their employment share nearly equals that of larger enterprises.
- Also the **share of SMEs in the total value added generated by the non-financial business economy** is still considerable across the EU27 in 2008 (59%), but in NWE again Luxembourg stands out with a share of 75%. The SMEs in the Netherlands and Belgium have shares in the non-financial business economy value added that are slightly above the EU27 average and in Ireland it is slightly below the EU27 average. Only in Germany and the UK, the SME-shares nearby equal the shares of larger enterprises.
- As regards **the economic sectors on which the value added generated by SMEs concentrates**, manufacturing and distributive trades are by far the leading sectors within the EU27 in 2008. This is also the case for most NWE countries, where manufacturing is either the leading sector (BE, DE, FR, LU, IE) or at a second position (UK, NL). Also the knowledge-intensive sectors "information & communication" and "professional scientific and technical activities" are very important in many NWE countries and hold together in the NWE countries either a first position (UK), a second position before manufacturing or distributive trades (LU, IE) or a third position behind manufacturing and distributive trades (NL, BE, DE, FR).

From the above it appears that in 2008 the contribution of SMEs to the total value added was lower in the EU27 than their contribution to employment, which resulted in a lower level of **apparent labour productivity in SMEs** and consequently in a higher labour productivity of large enterprises.[30] Although this situation holds also true for all NWE countries, one has to notice that the difference in labour productivity between SMEs and larger enterprises were slightly lower in some of them (UK, NL) and slightly higher in others (DE, BE, LU). Only Ireland stood out in NWE with an SME labour productivity that was markedly lower than that of larger enterprises.

A promising avenue for transnational cooperation in NWE could therefore be to enhance the competitiveness of businesses and SMEs particularly in the manufacturing sector but also in other knowledge-intensive sectors (information & communication; professional scientific & technical activities), notably by focussing on existing enterprise clusters or networks. Information from the European Commission's "Regional Competitiveness Index" on the strength of regional clusters based on data from the pre-crisis period (2006) suggests that within NWE there is indeed a need for action in this respect. Regional clusters in Ireland, the Netherlands and in most parts of Germany as well as in Flanders and Ile-de-France appear to be quite strong, but this appears to be not the case for many regional clusters in other parts of NWE (i.e. the whole of UK, larger parts of

[29] Improving the competitiveness of SMEs entails mainly actions which facilitate the access of SMEs to finance, which establish an environment favourable to business creation and growth or which encourage the entrepreneurial culture and help SMEs to operate outside their home countries and to improve their access to markets (i.e. internationalisation).

[30] One important factor which can generally explain this situation across all countries and sectors are the inherent characteristics of SMEs such as their inability to benefit from economies of scale, their relatively low level of capital intensity or their inability to adopt or develop innovations.

France, Walloon region, Luxembourg, parts of Rhineland Palatinate). The "hot spots" among the latter are particularly Scotland, Wales and several UK regions as well as several regions in France (Lorraine, Bretagne Bourgogne) and Luxembourg.

Whereas national and regional cluster policies should primarily aim to overcome existing market failures and funding gaps and especially to supply the bridge between companies and research institutions (e.g. by bringing together resources and expertise and by regionally promoting cooperation among businesses, public authorities and universities or by developing 'smart specialisation strategies'), **transnational co-operation could primarily focus on developing more EU-wide and globally competitive cluster networks** for both the regional traditional and the regional R&D/innovation clusters. Through inter-connecting regional clusters in a transnational perspective, a critical mass can be achieved for R&D and innovation, skills, funding, the cross-fertilisation of ideas and entrepreneurial initiatives. This, however, also implies that the various regional cluster initiatives need to be consolidated and streamlined.

Entrepreneurship[31]

The Global Entrepreneurship Monitor (GEM) provides data derived from yearly worldwide survey. An important indicator which results from this survey is the so-called Total Early Stage Entrepreneurial Activity (TEA). This is the percentage of 18-64 population who are actively involved in setting up a business they will own or co-own or who are currently an owner-manager of a new business.

Total Early Stage Entrepreneurial Activity is highest in the Netherlands, UK and Ireland. Total entrepreneurial activity is increasing in all NWE countries, apart from Ireland and especially in the Netherlands.

Nevertheless, there are different kinds of entrepreneurship: entrepreneurship driven by necessity or by opportunities. In the first case, someone sets up a business because there are no other job opportunities. In the other case, a business is started-up because someone sees an opportunity, for example to earn more money or to be independent. The latter is a better indicator for entrepreneurship as an accelerator for economic growth.

Entrepreneurship driven by necessity is especially high in Ireland, Spain and Greece, and low in Belgium, The Netherlands, Denmark and Sweden. In these countries opportunity driven entrepreneurship is dominant.

Social innovation and Eco-innovation

The focus of innovation support is generally defined on the basis of a particular sector or technology. However, innovation may also be geared towards addressing social or environmental issues within a specific territory. In this case, the concepts of 'social' or 'eco' innovation are of particular relevance.

According to the European Commission's Guide to Social Innovation[32], social innovation can be defined "*as the development and implementation of new ideas (products, services and models) to meet social needs and create new social relationships or collaborations. It represents new responses to pressing social demands, which affect the process of social interactions*". Social innovation is thus aimed at improving human well-being, it is not only good for society but also enhance individuals' capacity to act.

Because of the prominent role social innovation plays in the Europe 2020 agenda, it has also been presented as a key element of the cohesion policy architecture. The strategic role of social innovation in the delivery of Europe 2020 is reflected by the regulations of the Common Strategic Framework funds in particular the thematic focus on social innovation within five thematic objectives which shall ensure that social innovation takes place in all relevant policy fields (TO 1, 8, 9, 10, 11). Under TO1, social innovation is addressed through a specific investment priority. This shows that social innovation is part of the wider concept of innovation, moving away from 'just' technology-based

[31] Bureau Buiten, Analysis of Data & Policy Context NWE

[32] http://ec.europa.eu/regional_policy/sources/docgener/presenta/social_innovation/social_innovation_2013.pdf

innovation. As investment in innovation, together with investment in energy efficiency and supporting SME's competitiveness, will be the main orientation for ERDF in the coming financing period, this is a key investment priority[33].

Eco-innovation on the other hand is defined by the Eco-innovation observatory[34] as any innovation that reduces the use of natural resources and decreases the release of harmful substances across the whole life-cycle. It contributes both to environmental "clean-up" and to the dematerialisation of society. It is not just about clean technologies, but encompasses all changes that reduce resource use across the life-cycle, regardless of whether these changes were intended to be 'environmental' or not. This represents a shift in understanding about eco-innovation from belonging solely to the environmental industry to being integrated in all industries.

Transnational cooperation represents a means through which eco-innovation in the NWE could be further encouraged, on the basis of the strong innovation and research capital the region possesses. Transnationality is also a key dimension for the development of integrated innovative solutions to environmental issues (e.g. industrial symbiosis, development of life cycle approaches).

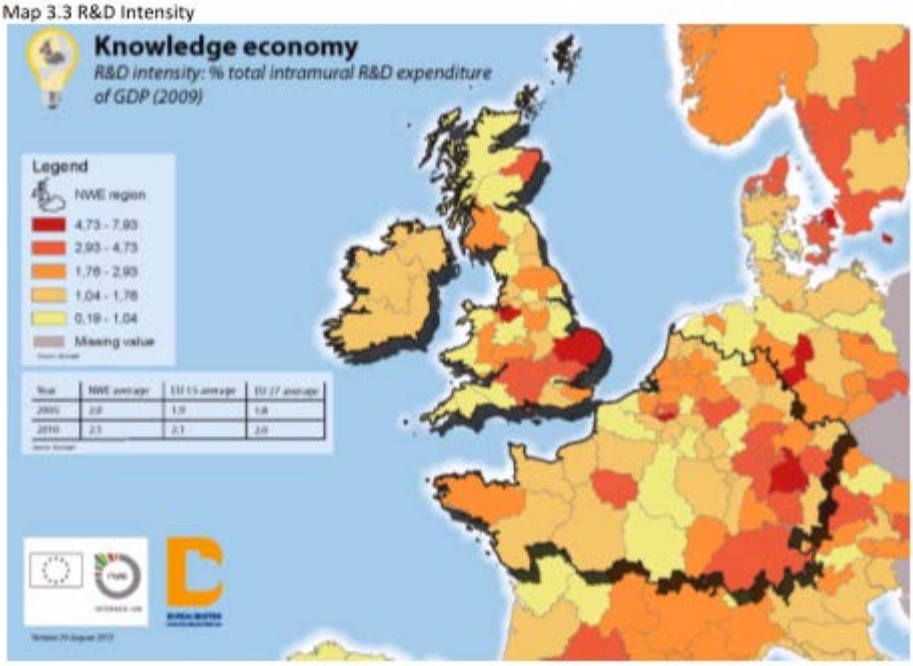
Social innovation and eco-innovation can be introduced into Operational Programmes through the selection criteria of projects. The objective of criteria setting for the selection of social and eco-innovation projects is at least two-fold. Once, the specific objectives of the theme to which the project should contribute has to be taken into account; second, the socially and environmentally innovative character of the project has to be warranted

4.2. Additional territorial considerations of Smart Growth in NWE

Knowledge production in terms of R&D is a typical regional phenomenon (see map 3.3) with high concentrations in technology advanced regions in Germany within NWE: Stuttgart (6.4%) (including surrounding regions like Darmstadt, Karlsruhe, Tubingen and Mittelfranken) and Cologne (3.2%). In France only Île de France (greater Paris region) has a notable R&D-intensity of 3.0%. Other high performers in France are situated outside the NWE-area. Additional concentrations of R&D expenditure can be found in Brabant Walloon, Belgium (7.6%) and in the UK around Cambridge and London (East Angelia (5.6%), Cheshire (6.5%), Berkshire, Buckinghamshire (3.5%) and Oxfordshire, Bedfordshire and Hertfordshire (3.5%), Hampshire and Isle of Wight (3%), Gloucestershire, Wiltshire and Bristol/Bath area (3%)[35].

[33] http://ec.europa.eu/regional_policy/sources/docgener/presenta/social_innovation/social_innovation_2013.pdf
[34] http://www.eco-innovation.eu/images/stories/Reports/EIO_Annual_Report_2012.pdf
[35] Bureau Buiten, Analysis of Data & Policy Context NWE

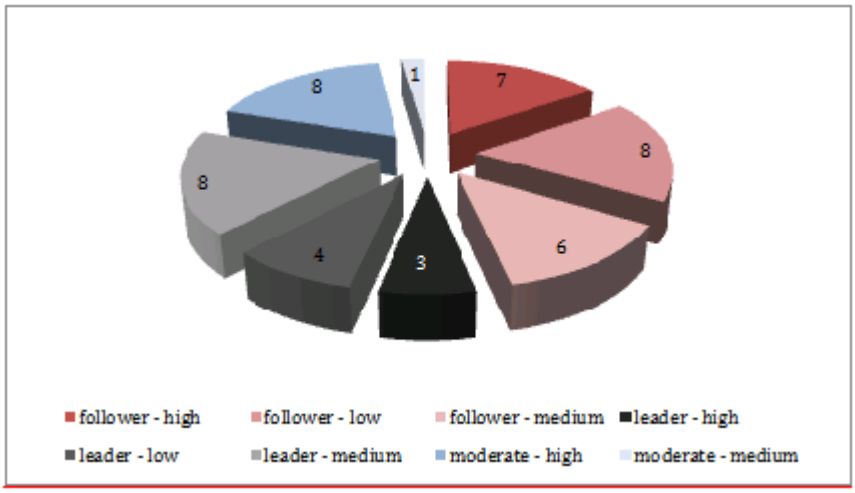
Map 3.3 R&D Intensity



The knowledge and innovation capacity of regions generally depends on a range of different factors,[36] many of which are included in the "Regional Innovation Performance Index". For NWE, this composite indicator shows that the transnational area is covered by regions with high and/or a medium-high level of **innovation performance** (i.e. South & Eastern Ireland, the whole of UK except Northern Ireland, Benelux countries, Ile-de-France & eastern part of France, south-west Germany & central-western Germany) as well as by regions with a medium level of innovation performance (i.e. Border-Midland-Western Ireland, UK-Northern Ireland, central and western France, some regions in Western Germany). Only the French region Nord Pas-de-Calais has a medium-low level of innovation performance.

The Regional Innovation Scoreboard also illustrates a slightly more polarised diversity within the NWE in terms of innovation performance among its regions. As illustrated in the following figure, there is an equal share among NWE regions of innovation followers (red) and leaders (gray), followed by nine regions considered as moderate innovators (blue).

Distribution of NWE regions by level of innovation performance



Source: ERAC and Technopolis based on indicators form the Regional Innovation Scoreboard

[36] e.g. the business culture, work force skills, education and training institutions, innovation support services, technology transfer mechanisms, R&D and ICT infrastructure, the mobility of researchers, business incubators, new sources of finance, the local creative potential and good governance.

Innovation performance of regions is mainly reflected by their specific features and, in particular, by their endowment of the basic factors which are important for innovation, which is well captured by a specific synthetic indicator measuring the **regional innovation potential**. For NWE, this indicator shows that the transnational area hosts a large number of those EU regions which are close to the global technology frontier (i.e. the "strong innovation generators"). They are mainly located in the UK (i.e. eastern part of Scotland & south-eastern part of England), the Benelux countries and in south-west and centre-west of Germany and more exceptionally also in France (i.e. Ile-de-France, Alsace). Most of the other NWE-regions are also considered "good innovation performers", but also a few "weak innovation absorbers" and "weak innovation diffusers" do exist in the UK (i.e. upper part of North-West England & extreme west of South England) and particularly in France (i.e. Basse-Normandie, Haute-Normandie, Picardie, Bourgogne).

The ESPON (2012) report 'Knowledge, Innovation, Territory (KIT)' demonstrates the extent to which the geography of innovation is much more complex than a simple core-periphery model; the capacity to turn knowledge and innovation into regional growth is different among regions, and the identification of regional specificities in patterns of innovation is essential to build targeted normative strategies efficient for a cohesion policy goal.

The project concludes that the variety of innovation patterns explains the failure of a "one size fits all" policy on innovation. The identification of regional specificities in patterns of innovation is essential to build targeted normative strategies efficient for a cohesion policy goal.

The KIT study identifies five innovation patterns:

1. The European science-based area is characterised by strong knowledge and innovation producing regions, specialized in general purpose technologies (i.e. GPTs), with a high generality and originality of the science-based local knowledge, and a high degree of knowledge coming from regions with a similar knowledge base. R&D endowment is also high in these regions.
2. The applied science area is made of strong knowledge producing regions characterized by applied science, with a high degree of knowledge coming from regions with a similar knowledge base. R&D activity is high also in this cluster of regions.
3. The smart technological application area shows a high product innovation rate, a limited degree of local applied science, and a high creativity which allows to translate external basic and applied science knowledge into innovation. R&D endowment is similar to the Applied science area.
4. The smart and creative diversification area is characterized by a low degree of local applied knowledge, some internal innovation capacity, high degree of local competences, which suggest that the not negligible innovation activities carried out in the area mainly rely upon tacit knowledge embedded into human capital. Moreover, regions in this area are strongly endowed with characteristics such as creativity and attractiveness that help to absorb knowledge and to adapt it to local innovation needs.
5. The creative imitation area (not in NWE) has a low knowledge and innovation intensity, but a relatively high entrepreneurship, creativity, attractiveness and innovation potentials

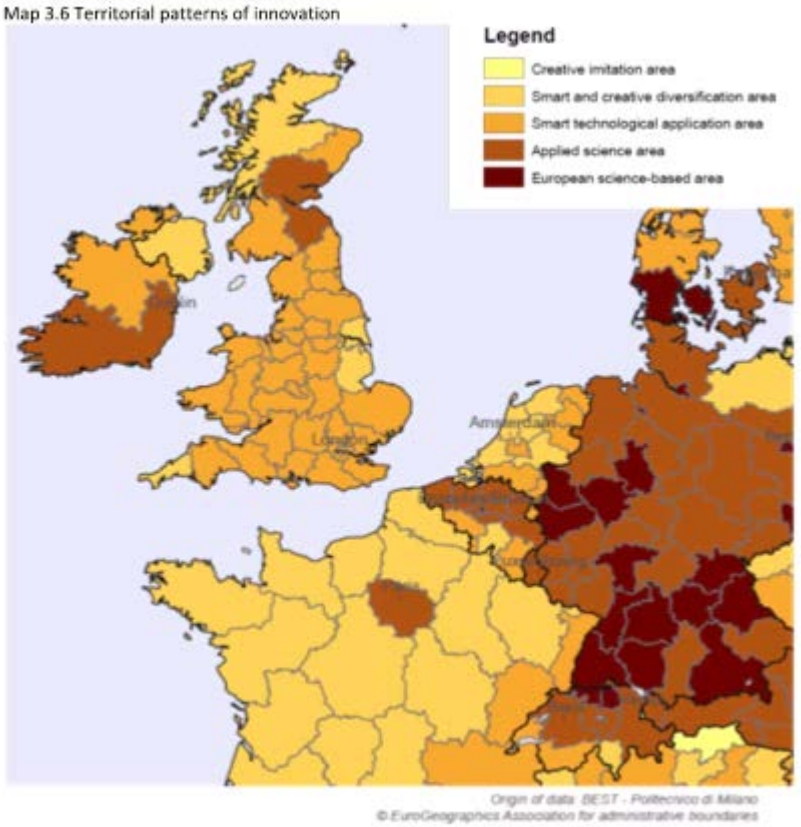
On this basis the KIT project, illustrates a diversified and scattered situation in terms of patterns of innovation in the NWE territory (MAP 3.6). In the part of the area, located on the borders of Belgium, Netherlands, Germany and France, many Nuts-2 regions of the TNC area are either applied science or even European science-based areas, due to a quite high generality and originality of science-based local knowledge, and a high degree of attractiveness of knowledge coming from other regions. The Eastern part of Scotland, the Southern and Eastern Ireland and the Ile de France (the region of Paris) are also applied science areas. East Anglia, Northern Ireland, Highlands and Islands and the rest of France and Netherlands are mainly smart and creative diversification areas due to low innovation intensity and high innovation potentials. The rest of the UK is mainly characterized by smart

technological application areas due to high product innovation rate and a limited degree of local applied science[37].

Regions can evolve from one pattern into another. 'Smart and creative diversification areas' in France and the Netherlands can be supported in order to move towards 'Smart technological application areas' through the reinforcement of local applied science. The 'European science based area' (parts in Germany) could be stimulated to diversify R&D activities through the identification of new applications in new industries, and moving thus towards an 'Applied science area'. Some 'Applied science area' regions (parts in Germany, Flanders, Ireland and UK), on their turn, could be specialised enough in General Purpose Technologies (GPT) fields to turn into a 'European science- based area' by strengthening their local science base. **In all these strategies, transnational cooperation helps generating critical mass**. Finally, efficient regions belonging to the category of 'Smart technological application areas' (UK, Netherlands, Walloon) could overcome the decreasing returns of R&D activities developed in limited specialised sectors by diversifying their specialised technological fields in which to innovate. In so doing, they would slowly change into an 'Applied science area'. **Transnational cooperation in this case is helpful to diversifying the local knowledge base.** [38]

The diversity of innovation patterns in NWE means the transnational innovation strategy in NWE should be diverse and tailor-made for each sector and region. Transnational cooperation can be a useful instrument to generate critical mass and diversifying the local knowledge base.

Map 3.6 Territorial patterns of innovation



Source: ESPON, 2012

Regional innovation support policies and approaches vary considerably among NWE regions. The Regional Innovation Monitor Platform allows comparing the different innovation policy and institutional frameworks across regions in Europe. The analysis of regional profiles of a sample of key NWE regions illustrates the diversity of innovation policy priorities among these. In spite of this, there appear to be a number of broad **common innovation policy priorities** including:

[37] Espon TERREVI project, Factsheet for the Nort West Europe Transnational Cooperation Area

[38] Bureau Buiten, Analysis of Data & Policy Context NWE – based on ESPON KIT

- Supporting regional economic clusters, the development of triple helix networks, and collaborative R&D projects
- Increasing the economic exploitation of research results, developing output driven research policy and supporting technology and knowledge transfer
- Fostering the internationalisation of innovation
- Strengthening research infrastructures
- Stimulate the use and uptake of innovation within SMEs (including access to innovation financing, particularly seed funding for early stage)
- Exploit low carbon opportunities as key innovation drivers

4.3. Sectoral considerations for the Smart Growth Objective

In addition to the territorial considerations of smart growth, it is also important to take into account the sectoral dimension of support for research and innovation within the NWE area. In order to identify priority sectors within the area, two sources have been consulted: the European Commission's Regional Innovation Monitor and the European Cluster Observatory.

Based on the assessment of the regional innovation strategy documents inventoried on the Regional Innovation Platform for a sample of NWE regions, there appear to be a number of common priority sectors targeted by innovation support policies:

- Information and Communication Technologies
- Environment/ Green technologies
- Transport
- New and advanced materials
- Health/medical
- Agro-food

The following table presents an overview of the key innovation sectors as identified within regional innovation strategic documents for a sample of NWE regions[39].

[39] The data presented in the table was obtained from the Regional Innovation Monitor covering all NWE countries except Luxembourg. For Luxembourg, information was obtained from the National Reform Program for the Grand Duchy of Luxembourg under the Europe 2020 strategy (April 2011)

Country	Sample of NWE Regions	Electronics	ICT and telecom	Health	Medical technologies	Pharmaceuticals	Bio technologies	Green technologies	Eco construction	Transport mobility	Automotive	Railway	Logistics	Aerospace	Naval	New and advanced materials	Chemical sector	Nano and micro technologies	Tourism	New media / creative industries	Business services	Energy	Waste management and cleanup	Agro-food and food security
Belgium	Région de Bruxelles capitale		X	X				X																
Belgium	Vlaams Gewest	X	X							X							X				X			
Germany	Baden Wurttemberg															X								
Germany	Bayern									X	X	X	X	X		X	X	X						
Germany	Nordrhein Westfalen				X		X	X								X		X				X		
France	Ile de France	X				X	X																	
France	Bourgogne			X			X	X								X								X
France	Nord Pas de Calais			X					X		X	X	X			X						X	X	X
France	Bretagne		X	X				X			X				X									X
Ireland	Border, Midland and Western		X																					
Netherlands	Overijssel			X				X												X				X
Netherlands	Gelderland			X														X						X
Netherlands	Flevoland		X	X									X						X	X	X			
Netherlands	Noord Brabant				X											X								X
Netherlands	Limburg			X							X						X					X		X
UK	East of England	X	X				X																	
UK	Wales			X				X								X						X		
Luxembourg			X	X				X								X					X			
UK	Scotland		X			X															X			
TOTAL		3	8	10	2	2	4	7	1	2	4	2	3	1	1	8	3	3	1	2	4	4	1	7

Source: Regional Innovation Monitor (except for Luxembourg)

Based on the specialisation measure[40] presented by the European Cluster Observatory, the NWE region is characterised by a high level of specialisation in two knowledge-intensive business service sectors: education and knowledge creation, and business services. Biotechs, Pharmaceuticals, and medical devices are the main sectors of specialisation in the field of life-sciences. In terms of standard sectors, the NWE area displays high levels of specialisation in the fields of entertainment, chemical products and plastics, and aerospace and automotive.

Table: Main cluster specialisation sectors in the NWE area

FIELD	SECTORS
Knowledge-intensive business services	Education and knowledge creation
Standard	Entertainment
Life-science	Biotech
Standard	Instruments
Knowledge-intensive business services	Business services
Standard	Chemical products
Standard	Plastics
Standard	Aerospace
Standard	Automotive
Life-science	Pharmaceuticals
Standard	Stone quarries
Standard	Metal manufacturing
Standard	Jewellery and precious metals
Standard	Production technology
Standard	Lighting and electrical equipment
Standard	Oil and gas
Standard	Power generation and transmission
Life-science	Medical devices
Standard	Tourism and hospitality

Source: ERAC & Technopolis based on European Cluster Observatory Data

In addition to this, the NWE area is home to a number of "strong clusters in innovative regions", based on the rating system designed by the European Cluster Observatory. The indicator is developed on the basis of the Regional Innovation Scoreboard (to identify innovative regions) and the size, specialisation and focus indicators of the European Cluster Observatory[41].

Table: Strong clusters in innovative regions in the NWE area

FIELD	SECTORS
Region de Bruxelles Capitale	Financial Services
Vlaams Gewest	Pharmaceuticals
Baden Wurttemberg	Metal Manufacturing, Production technology, Automotive, IT, Metal manufacturing
Bayern	IT, Production technology, automotive, plastics
Nordrhein Westfalen	Metal manufacturing; production technology; building fixtures, equipment and services;
Ile de France	Financial services
Ireland	IT, Tourism and hospitality
East of England	Education and knowledge creation

[40] The specialisation measure compares the proportion of employment in a cluster category in a region over the total employment in the same region, to the proportion of total European employment in that cluster category over total European employment.

[41] One star is awarded for size (whether a cluster is in the top 10% of all clusters in Europe within the same cluster category in terms of the number of employees.), specialisation (proportion of employment in a cluster category in a region over the total employment in the same region, to the proportion of total European employment in that cluster category over total European employment), and focus (the extent to which the regional economy is focused upon the industries comprising the cluster category and relates employment in the cluster to total employment in the region).

Scotland	Education and knowledge creation

Source: European Cluster Observatory

Topics relating to the "Smart Growth Objective" of Europe 2020 (i.e. actions on innovation, education, training & lifelong learning and the digital society)				
	STRENGTHS	**WEAKNESSES**	**OPPORTUNITIES**	**THREATS**
Strengthening research, technological development and innovation	• Excellent world-class R&D infrastructure and high R&D intensity: NWE hosts many regions of the EU which have surpassed the European target value of 3% in R&D expenditure (10 out of 24) and also a number of others which are close to the target. • High and very high levels of human resources employed in science and technology, esp. on the continental part of NWE. • For employment in high-tech sectors, NWE holds a generally strong position in this segment in an EU-wide perspective (many NWE regions have employment levels above the EU27 average). • The largest part of NWE is covered by regions with high and/or a medium-high level of innovation performance. NWE also hosts a large number of EU regions with a high innovation potential (i.e. the "strong innovation generators") and also many regions with a good innovation potential ("good innovation performers"). • High concentrations of knowledge-intensive services, including sectors which are important for the well-being and an attractive environment like health care, creative industries and leisure industries. • Patenting levels in the NWE are higher than the EU15 average • High levels of cluster specialisation in knowledge intensive business sectors (education and knowledge creation,	• High disparities among NWE regions in total intramural R&D expenditure • Employment in Knowledge Intensive Services is concentrated around large city regions • A general dichotomy among NWE regions between innovation leaders and innovation followers • In a global perspective, R&D spending of most NWE countries still remains behind the R&D expenditure of most of their main competitors (esp. Japan, South Korea, US), but often still above the spending in BRIC countries. Within the EU, some NWE countries are also behind the Scandinavian countries. Within NWE, high geographical concentration of R&D spending (a few regions), lower levels in all other regions. • Only a few NWE regions have a very high shares of researchers employed in all sectors and also very high shares of employment in high-tech sectors (pronounced geographical concentration → territorial divide). • Strong geographical concentration of top innovation performance and top innovation potential (pronounced territorial divide). Also high innovation concentration in large companies, but not so much in SMEs. • Persisting problems as regards a transfer of science and technological research into products & other commercial outputs.	• All NWE countries have a sector/cluster oriented strategy for innovation. In some cases, these are developed at the regional level. • The NWE programme may promote excellence and synergy by matching regional innovation approaches and connecting clusters from the bottom up. Promising avenues for transnational cooperation in NWE to improve smart growth thus include economic relations between knowledge clusters across NWE. • The transnational approach may provide a means to develop joint strategies to attract highly skilled knowledge workers into NWE and support their integration • Transnational cooperation can be a useful instrument to generate critical mass and diversify the local knowledge base within regions • Smart specialisation can be a tool for a further raise of R&D spending in NWE regions, thus leading to a more widespread fulfilment of the 3% target. • High and very high levels of human resources employed in science and technology as an opportunity to foster competitiveness and to cope with globalisation. • Increasing potential of knowledge-intensive services & creativity • Regional innovation strategic documents reveal the existence of common regional innovation support priority fields within	• The knowledge intensive economy in the NWE is important, but under strain form the economic crisis and reduction in investments • There are significant regional differences which seem to be increasing in knowledge intensive services, innovation potential, and innovation performance • Continuing public indebtedness crisis and problems of the EU banking sector might lower public and private R&D spending. • Increasing R&D intensity in the developing economies (BRIC countries) • Smart specialisation can even further increase the already observable geographical concentration in terms of regional innovation performance and regional innovation potential (further growing territorial divide). • The adoption of a 'one-size' fits all approach to innovation support may prove to be ineffective due to the diversity of regional profiles within NWE • The promotion of process innovation may result in the reduction of jobs in 'blue collar' regions

	business services), life sciences (biotech and pharmaceuticals) and standard sectors such as entertainment, instruments, chemicals, plastics, aerospace and automotive • The NWE are is home to an important number of 'strong clusters in innovative regions' • Institutes and regions in NWE are well represented in all three of the existing Knowledge and Innovation Communities. There is a particularly important number of co-location centres of the Climate KIC located in NWE.		the NWE area • Eco-innovation and social innovation represent a means through which the high innovation potential of the region can be mobilised to address key social and environmental issues in the NWE area	
Enhancing access to, and use and quality of, information and communication technologies	• Relatively good global positioning of most NWE countries (DE, UK, LU, CH, BE) in terms the overall ability of individuals to access & use ICT. • Broadband connection above 50% in most NWE-areas, but regions with more than 75% of household broadband connectivity only exist in the UK and in the Netherlands. Here also high shares of e-commerce activities of individuals. New ICT-based technologies and services easily available (e.g. e-health, e-government etc) • Low share of the population never having used the internet esp. in the UK, the NL, LU, DE and larger parts of BE. • Shares of persons having computer & internet skills (low, medium, high) is in nearby all NWE countries clearly above the EU27 average (NL, DE, UK, BE, FR). As regards only the computer skills levels, favourable position of regions in NL, DE, and UK and the whole of LU. • The basic conditions for a highly innovative ICT sector are present in NWE (broadband access and internet skills)	• Weak global positioning of France & Ireland in terms the overall ability of individuals to access & use ICT. • Weak broadband connection of households in parts of Ireland (Border, Midland and Western region), Belgium (Walloon region) and in larger parts of France larger parts of France (except Ile-de France). Here also lower shares of e-commerce activities of individuals. Lack of potential for developing new ICT services. • High share of the population never having used the internet esp. in France (Nord Pas-de-Calais & Brittany), Ireland (the Border, Midland and Western region) and in some provinces of the Walloon region. • Shares of persons in Ireland having computer & internet skills (low, medium, high) is at or close the EU27 average. As regards only the computer skills levels, less favourable position of regions in IE and BE.	• Further development of the Information Society in NWE and especially catching-up processes in the still weakly connected regions continue. This creates a potential for closing the broadband connectivity gap in NWE and offers the possibility for further expanding ICT applications & services to improve the life of citizens (e.g. health & public services). • Catching-up processes in the still weakly internet using regions continue and potentials exist for closing the internet usage gap in NWE. • Successive elimination of the ICT skills barrier (e.g. through better education), creating a digitally inclusive Information Society in NWE.	• Loss of currently good positioning in a global context (i.e. • Insufficient investment by private ICT suppliers and pressure on public finances reduces private & public investments in broadband (persistence of broadband connectivity gap in NWE), while new technologies and services continue to develop faster than infrastructure is developing. • Continuing existence of digital inclusion gap due to various reasons (e.g. affordability due to low incomes, lack of ITC skills, age-specific factors etc). • Persistence of the ICT skills barrier (e.g. through low income & lacking opportunity), creating a digitally excluded population segment in the NWE Information Society.

Enhancing the competitiveness of SMEs	• Existence of EU-level national and regional policies for competitiveness and SMEs. • Existence of national and regional policies to support start-ups. • A large number of NWE regions have high or medium-high levels of competitiveness in the EU27 and also strong and largely competitive SMEs in manufacturing and other knowledge knowledge-intensive sectors (information & communication; professional scientific & technical activities). • Within NWE, regional clusters in Ireland, the Netherlands and in most parts of Germany as well as in Flanders and Ile-de-France appear to be quite strong.	• National and regional policies for competitiveness and SMEs are not yet well-interlinked. EU funding is not flexible enough for SMEs. • The support to new business development models is not a competence of ETC programme actors & main stakeholders. • Different factors still limit the creation, growth and thus the competitiveness of SMEs: Relatively low level of capital intensity, difficult access of SMEs to finance, unfavourable environment for business creation and growth, lacking ability to adopt or develop innovations, limited operation of SMEs outside & access to markets (i.e. internationalisation). • Within NWE, regional clusters are weak in the whole of UK, larger parts of France, Walloon region, Luxembourg, parts of Rhineland Palatinate). The "hot spots" among the latter are particularly Scotland, Wales and several UK regions as well as several regions in France (Lorraine, Bretagne Bourgogne) and Luxembourg.	• Enhancing the industrial competitiveness of businesses and SMEs particularly in the manufacturing sector, but also in other knowledge-intensive sectors (information & communication; professional scientific & technical activities). • Focus action on existing enterprise clusters or networks in Sectors of Specialisation : Through inter-connecting regional clusters in a transnational perspective, a critical mass can be achieved for R&D and innovation, skills, funding, the cross-fertilisation of ideas and entrepreneurial initiatives. • The transnational approach may provide opportunities to develop the international competitiveness of SMEs and develop joint opportunities to respond to new consumer trends (e.g. online retailing)	• Further growing public indebtedness and escalation of EURO-crisis: Shortage of public funding support for SMEs • Further growing public indebtedness and escalation of EURO-crisis: growing problems of SMEs to access private financing sources (e.g. via banks) and lack of venture capital for SMEs and start-ups (particular at the early-stage, private capital lenders can be increasingly reluctant to invest). • Further weakening of regional clusters in NWE.

4.4. Conclusions for the Smart Growth Objective

What are the main lessons from the current Interreg IVB NWE programme?

The following paragraphs provide a picture of some of the IVB programme's main outputs until 2012. Even though these figures provide a preliminary indication with regard to the types of projects being funded, it is important to keep in mind that they illustrate the stock of projects at a given point in time, rather than the flow throughout the programme's lifetime.

Smart Growth represents the **second strongest NWE IVB programme area** with a total of 23 projects relating to innovation and entrepreneurship support. It is important to note however that Investment Priority 1b (Promoting business R&I investment, product and service development, technology transfer, social innovation and public service applications, demand stimulation, networking, clusters, open innovation through smart specialisation) includes the highest number of projects financed by the current programme (16% of all programme projects = 15 projects). The support of research infrastructures and centres of excellence (1a), as well as the support of technological and applied research are completely absent from the programme (1c). **Support to SMEs is also limited**.

The analysis of the projects relating to investment priority 1b show a wide range of scopes and outcomes. **Sectoral specialisation within the programme is weak**. In addition, **territories involved in 'smart growth' projects generally perform well in terms of innovation**. The support of inter-cluster cooperation and development of triple helix networks is also limited.

The Interreg NWE programme has thus been successful in developing and supporting a certain type of innovation-oriented projects. It has developed a reputation in this sense and should probably seek to capitalise on the cooperation having taken place in this field**. Increasing specialisation based on the identification of key sectors and involving a broader and more diverse set of stakeholders (including innovation underachievers, private investors like business angels, capital investors, etc.) in projects under this objective remain key challenges**.

Where could transnational cooperation be of added value and under what conditions?

The NWE area hosts some of the top performers in Europe in terms of innovation. However the area is also characterised by strong geographical concentration of top innovation performance and top innovation potential (pronounced territorial divide). There are significant regional differences which seem to be increasing in knowledge intensive services, innovation potential, and innovation performance. Innovation also appears to be concentrated within large enterprises, rather than SMEs. In addition, the NWE area suffers from persisting problems as regards to the transfer of science and technological research into products & other commercial outputs, as well as the circulation of knowledge among quadruple helix stakeholders.

Transnational cooperation could thus be a useful tool in addressing one general challenge and several specific related challenges. These are presented in the following paragraphs in order of their relevance for the VB NWE programme:

1. **Closing the territorial gaps in terms of innovation performance and innovation potential:** This is a general challenge for the NWE which can only be reached by addressing a subset of more specific issues. Ensuring NWE regions with lower innovation performance are not left behind and actually benefit from the high innovation capital found within the transnational cooperation area. This can only be done if a tailored approach to innovation support is adopted on the basis of the diversity of regional profiles within NWE. Transnational cooperation can be a useful instrument to generate critical mass and diversify the local knowledge base in different types of regions. It is also a good complement to existing European research and innovation programmes which tend to be territorially blind. As a result, a special focus must be set on encouraging collaboration between weak-strong regions and diffusing knowledge and know how from innovation leaders to innovation followers. For example, special selection criteria could be used in order to add weight to projects involving regions with different innovation performance levels.

2. **Reinforcing quadruple helix innovation and support the internationalisation of the regional clusters in sectors of common interest**: Knowledge sharing is key in the innovation process. Cluster-based approaches facilitate knowledge sharing and the involvement of stakeholders from the business, government and educational sector around common objectives. All NWE countries have a sector/cluster-oriented strategy for innovation. In some cases, these are developed at the regional level. Promising avenues for transnational cooperation in NWE to improve smart growth thus include economic relations between knowledge clusters across NWE. **By inter-connecting regional clusters in a transnational perspective, a critical mass can be achieved for R&D and innovation, skills, funding, the cross-fertilisation of ideas and entrepreneurial initiatives**. The transnational approach would allow existing clusters to think outside of their regional/national silos.

3. **Supporting the internationalisation of SMEs**: Supporting the internationalisation of SMEs may play a key role in their development. This is an area in which transnational cooperation would have a natural added value. SMEs tend naturally to think locally and a thus in need of developing links with partners and know how from other geographic scopes. However, in order to effectively involve SMEs in the NWE programme, this needs to happen through 'intermediary' structures (e.g. chambers of commerce) that can act as bridges. In addition, transnational cooperation needs to ensure projects are geared towards the delivery of real products and services that would not have been otherwise produced. The transnational approach may provide opportunities to develop the international competitiveness of SMEs as well as joint opportunities to respond to new consumer trends (e.g. online retailing).

4. **Facilitating the exploitation of research outcomes and entry of innovations into the market:** The NWE region faces persisting problems as regards a transfer of science and technological research into products & other commercial outputs. This particular issue is identified by a number of regional innovation strategic policy documents within the area. However the additionality of transnational cooperation on this issue seems to highly depend on the type of project developed. **Generally speaking, technology and knowledge transfer is best addressed by regional and national RDI support programmes**. Yet, transnational cooperation could be of value for example in supporting schemes to increase collaboration and the exchange of knowledge between among technology transfer offices. This issue can also be tackled by promoting collaboration among clusters from a transnational perspective (cf. above).

5. **Promoting the uptake of innovation within SMEs:** Innovation tends to be concentrated around larger companies rather than SMEs. Cluster-based approaches may prove to be a successful tool in tapping into the innovation potential of SMEs (cf. reinforcing quadruple helix innovation and support the internationalisation of the regional clusters in sectors of common interest). The main obstacle to innovation within SMEs however is gaining access to innovation funding. Here, transnational cooperation may be of limited value for two reasons:
    - Transnational programmes have limited financial and technical capacities to make funding available for SMEs[42]
    - Member state regulation on state aid to businesses may represent a barrier to intervention

    Transnational cooperation could be of added value in sharing experiences and practices on how to promote the uptake of eco-innovation and social innovation in SMEs.

Addressing these issues will require three basic pre-conditions:

- **Adopting a flexible and tailored approach to innovation support**, based on the different regional innovation conditions and potential. The adoption of a 'one-size' fits all approach to innovation support may prove to be ineffective due to the diversity of regional profiles within NWE.

[42] The NWE programme has this far decided not to make use of financial engineering instruments.

- **Developing a sectoral specialisation approach** on the basis of key priority sectors, in order to avoid spreading resources too thin. The NWE programme must develop a sector-based approach based on a common vision of interests for all types of regions. Based on policy and data analysis there are eight fields which seem to be of relevance for the area:

    - Information and Communication Technologies
    - Environment/ Green technologies
    - Transport (aerospace, rail and automotive)
    - New and advanced materials
    - Health/medical (e.g. biotech)
    - Agro-food
    - Chemical products and plastics
    - Entertainment & creative industries

    However, there is a need to further discuss the fields and sub-fields the future programme should focus on (prioritising priorities). Adopting a narrow sectoral approach at the outset of the programme may limit the number and types of stakeholders it may attract. The sectoral specialisation of the programme can be reinforced through actions implemented under different Thematic Objectives (e.g. 1 & 3 – supporting cooperation of clusters in a specific sector).

- Supporting new forms of innovation – or **developing innovation with a social and environmental purpose.** Promoting smart growth needs to be linked to the promotion of sustainable and inclusive growth. As a result, eco-innovation and social innovation appear to be interesting means through which the high innovation potential of the NWE area can be mobilised to address the key social and environmental issues it faces. Developing a more social-sensitive innovation approach may provide a means to reinforce cohesion within NWE, attract new types of stakeholders into the programme and reinforce the 'inclusive' dimension of the programme. Increasing resource efficiency through eco-innovation is of imminent relevance for territorial development in NWE, because it can bring about major economic opportunities, improve productivity, drive down costs and boost competitiveness and thus secure growth and jobs. It is worth mentioning that institutes and regions in NWE are well represented in all three of the existing Knowledge and Innovation Communities including the Climate and the InnoEnergy KICs.

In light of the above, there is a clear interest for the NWE programme to focus on Thematic Objective one (strengthening research, technological development and innovation) and Thematic Objective three (enhancing the competitiveness of SMEs). Enhanced access to use and quality of ICT is not for the time being a key priority of the already highly digitalised NWE area.

5. SWOT analysis for the "Sustainable Growth Objective"

Sustainable development, generally defined as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", belongs to the fundamental and overarching Treaty objectives of the European Union which was made further concrete by the EU Sustainable Development Strategy adopted by the 2001 Gothenburg European Council. After a review in 2004 and 2005, the renewed EU Sustainable Development Strategy (EU SDS) contains four key objectives and ten policy guiding principles[43] and describes how the EU will more effectively meet the challenge of sustainable development. The overall aim is to achieve a continuous improvement in the quality of life of citizens through sustainable communities that manage and use resources efficiently and tap the ecological and social innovation potential of the economy, so as to ensure prosperity, environmental protection and social cohesion.

The economic, environmental and transport-related dimensions of the renewed EU SDS[44] are addressed in the Europe 2020 Strategy by the sustainable growth objective, which means that (...) *building a resource efficient, sustainable and competitive economy, exploiting Europe's leadership in the race to develop new processes and technologies, including green technologies, accelerating the roll out of smart grids using ICTs, exploiting EU-scale networks, and reinforcing the competitive advantages of our businesses, particularly in manufacturing and within our SMEs, as well through assisting consumers to value resource efficiency. Such an approach will help the EU to prosper in a low-carbon, resource constrained world while preventing environmental degradation, biodiversity loss and unsustainable use of resources. It will also underpin economic, social and territorial cohesion.* [45]

The different aspects addressed by the EU SDS and the sustainable growth objective also play an important role in the new Structural Funds programming period[46] and their imminent territorial dimension and relevance for the future development of NWE may indeed offer scope for future transnational cooperation between local, regional and national authorities.

Generally speaking, the NWE is on a similar level as the EU27+4 standards when it comes to the main indicators for sustainable growth (wind energy potential, ozone concentration and potential vulnerability to climate change). However, as is the case with smart growth indicators, **the NWE territory displays significant levels of heterogeneity among member regions**. As a result, it is crucial to take into account the territorial dimension of sustainable growth when analysing the situation of the NWE area and defining priority actions under this objective.

5.1. General Indicators on Sustainable Growth

Renewable energy production, Energy Efficiency and Energy Distribution

In terms of **renewable energy** which comes from natural sources (wind, sunlight, tide) and geothermal heat or from traditional biomass, one can summarise the overall situation in NWE as follows: In terms of primary production of energy, the share of renewables has increased vastly in Germany from about 16% in 2006 to 25% in 2010. Apart from Germany and Luxembourg (the latter

[43] Key objectives: environmental protection, social equity and cohesion, economic prosperity, meeting our international responsibilities. Policy guiding principles: promotion and protection of fundamental rights, solidarity within and between generations, open and democratic society, involvement of citizens, involvement of businesses and social partners, policy coherence and governance, policy integration, use best available knowledge, precautionary principle and make polluters pay.

[44] The framework for monitoring the renewed Sustainable Development Strategy of the EU follows a gradient from the economic dimension (i.e. socioeconomic development, sustainable consumption and production) and the social dimension (i.e. demographic changes, social inclusion, public health) over the environmental dimension (i.e. climate change and energy, natural resources) and transport-related dimension (transport-related energy consumption, mobility and transport impact) to the global dimension (i.e. global partnership) and the institutional dimension (i.e. good governance). Eurostat (2011): Sustainable development in the European Union. 2011 monitoring report of the EU sustainable development strategy, Luxembourg.

[45] Commission of the European Communities (2010): EUROPE 2020 op. cit., p.16.

[46] i.e. Article 8 of the proposal for the CSF funds regulation stating that the (…) *Member States and the Commission shall ensure that environmental protection requirements, resource efficiency, climate change mitigation and adaptation, disaster resilience and risk prevention and management are promoted in the preparation and implementation of Partnership Contracts and programmes.*

having an extremely high share of renewables due to very limited absolute value production of energy), the share of renewables is limited to a range of 15% in France to 4% in the UK and the Netherlands. In terms of consumption the share of renewable in total Gross Inland Consumption of energy is increasing in all EU countries, but it remains still limited in the NWE-countries ranging from 12% in France (highest) to 3% in Luxembourg (lowest). Except for France all NWE-countries have a share below the EU27 average. As for the greenhouse gas emission targets, the Europe 2020 targets on the share of renewable in energy consumption are ambitious and it is questionable whether they will be met by the NWE countries in the medium-term.

Energy dependence shows how much an economy relies on imports to meet its domestic energy demand. The EU depends on foreign import of energy for more than 50%. **Energy dependency of NWE countries varies between 28% (UK) and around 100% (Luxembourg).** The energy dependency increased between 2000 and 2009 in the United Kingdom, Germany and Ireland.

Box 2: **Renewable energy potential in the NWE are based on the ESPON TerrEvi project results**
• The NWE area has similar wind power potential compared to average EU27+4 space despite high internal disparities. In particular Ireland and Northern Scotland have high wind power potentials • NWE has low solar power potential compared to average EU27+4 space. The positively outstanding regions are found in the French western part of the Programme area. The solar energy potential pattern is not only dependant on climate, but also on the degree of urban development • As the Atlantic ocean has some of the greatest wave potential in Europe, NWE coastal areas fully have the greatest capacity to develop wave power.

The EU-level paradigm shift towards sustainability cannot be reached without solid, reliable and smart **energy networks**. At the moment, however, networks are often outdated and also poorly interconnected which requires that significant improvements have to be made in the future in terms of grid interconnection. **NWE is directly concerned by a number of European priority corridors for future infrastructure development in the field of electricity, gas and oil** (i.e. North-South Gas Corridor in Western Europe, North Seas Offshore Grid, Central-south Eastern Electricity Connections), which can also have be of relevance for transnational territorial development. **This relevance is low as far as the direct financing and realisation of such infrastructures are concerned, but already much more important when it comes to the question of ensuring a more efficient and also transparent permitting and border-crossing cooperation in the field of infrastructure development for increasing public acceptance and further speeding up the overall infrastructure deployment process**[47]**.** This can be achieved through supporting actions which assist the regions and the stakeholders especially in framing the implementation of projects of European interest: new tools are needed for improving regional cooperation and permitting procedures or for a better coordination of existing EU environmental assessment procedures already at an early stage. Also better methods and tools for decision makers are needed to explain the benefits of a specific project to the wider public and for associating them with the process. Finally, better information and communication should take place in direction of consumers and citizens on the benefits of infrastructure development and on smart grids especially in terms of security of supply, decarbonisation of the energy sector and energy efficiency.

[47] European Commission, Directorate General for Energy (2010): Communication 'Energy infrastructure priorities for 2020 and beyond — A Blueprint for an integrated European energy network' (COM(2010) 677 final of 17 November 2010): The Communication stresses that the grids must be urgently extended and upgraded to foster market integration and maintain the existing levels of system security, but especially to transport and balance electricity generated from renewable sources which is expected to more than double in the period 2007-2020. Under the current regulatory framework, however, all necessary investments will not take place or not as quickly as needed, notably due to the non-commercial positive externalities or the regional or European value-added of some projects, whose direct benefits at national or local level is limited. The slowdown in investment in infrastructure has been further compounded by the recession. Long and uncertain permitting procedures were also indicated by industry and regulators as one of the main reasons for delays in the implementation of infrastructure projects, notably in electricity. The time between the start of planning and final commissioning of a power line is frequently more than 10 years. Cross-border projects often face additional opposition, as they are frequently perceived as mere "transit lines" without local benefits. In electricity, the resulting delays are assumed to prevent about 50% of commercially viable projects from being realised by 2020. This would seriously hamper the EU's transformation into a resource efficient and low-carbon economy and threaten its competitiveness. In offshore areas, lack of coordination, strategic planning and alignment of national regulatory frameworks often slow down the process and increase the risk of conflicts with other sea uses later on.

Box 3:
Priority corridors for electricity, gas and oil covering the NWE area[48]

Offshore grid in the northern seas

The 2008 Second Strategic Energy Review identified the need for a coordinated strategy concerning the offshore grid development: "(…) a Blueprint for a North Sea offshore grid should be developed to interconnect national electricity grids in North-West Europe together and plug-in the numerous planned offshore wind projects". In December 2009, nine EU Member States and Norway signed a political declaration on the North Seas Countries Offshore Grid Initiative (NSCOGI) with the objective to coordinate the offshore wind and infrastructure developments in the North Seas. The nine EU members will concentrate about 90% of all EU offshore wind development.

According to the information contained in their NREAPs, installed capacity is projected at 38.2 GW (1.7 GW other marine renewable energies) and production at 132 TWh in 2020(50). Offshore wind could represent 18% of the renewable electricity generation in these nine countries.

Applied research shows that planning and development of offshore grid infrastructure in the North Seas can only be optimised through a strong regional approach. **Clustering of wind farms in hubs could become an attractive solution compared to individual radial connections, when distance from the shore increases and installations are concentrated in the same area**. **For countries where these conditions are met, such as Germany, the connection costs of offshore wind farms could thereby be reduced by up to 30%. For the North Sea area as a whole, cost reduction could reach almost 20% by 2030.** In order to realise such cost reductions, a more coordinated, planned and geographically more concentrated offshore wind development with cross-border coordination is absolutely necessary. This would also allow reaping the combined benefits of wind farm connection and crossborder interconnections, if the connection capacity is well dimensioned and hence results in a positive net benefit.

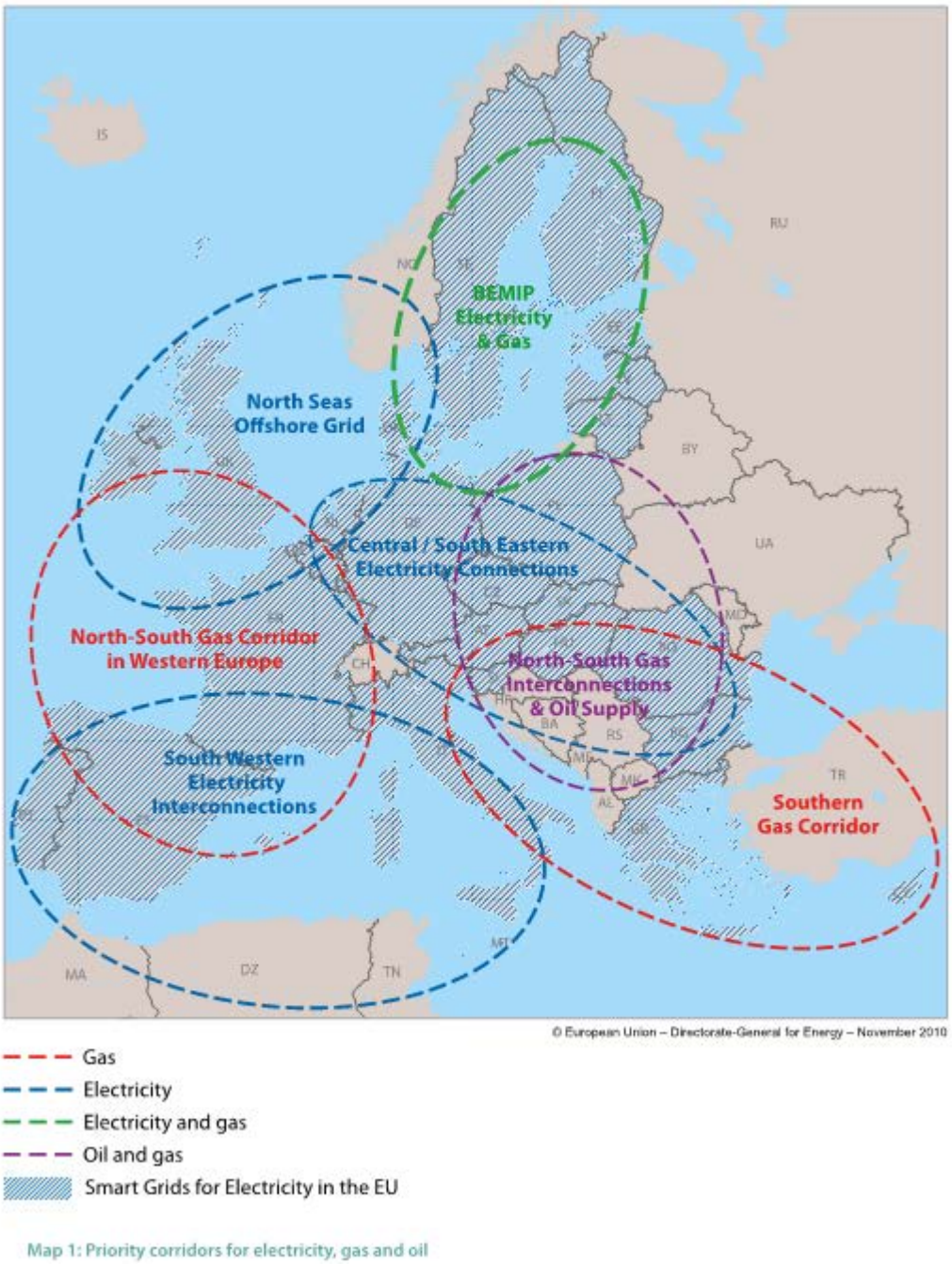
Recommended actions include review planned wind farm development in order to identify possibilities for hub connections and interconnections for electricity trade, consider overall development strategies and regional and longer-term benefits when approving new offshore transmission lines, revise the regulatory framework and make it compatible should be examined, covering inter alia operation of offshore transmission assets, access to and charging of transmission, balancing rules and ancillary services.

North-south Corridor in Western Europe

The strategic concept of the North-South natural gas interconnections in Western Europe, that is from the Iberian peninsula and Italy to North-west Europe is to better interconnect the Mediterranean area and thus supplies from Africa and the Northern supply Corridor with supplies from Norway and Russia. There are still infrastructure bottlenecks in the internal market which prevent free gas flows in this region, such as for example the low interconnection level to the Iberian peninsula, preventing the use of the well-developed Iberian gas import infrastructure to its best. **The Spain-France axis has been a priority for over a decade, but is still not completed**. However, progress has been achieved in recent years, thanks to the better co-ordination of the national regulatory frameworks – taken up also as a priority by the South-West Gas Regional Initiative – and the active involvement of the European Commission. Another indication for imperfect market functioning and the lack of interconnectors are the systematically higher prices on the Italian wholesale market compared to other neighbouring markets.

At the same time, as the development of electricity from variable sources is expected to be particularly prominent in this corridor, the general short-term deliverability of the gas system needs to be enhanced to respond to the additional flexibility challenges to balance electricity supply. The main infrastructure bottlenecks preventing the correct functioning of the internal market and competition need to be identified in this corridor and stakeholders, shall work together to facilitate their implementation. Secondly, an integrated analysis between the electricity and gas system – taking into account both generation and transmission aspects – should lead to the assessment of the gas flexibility needs and the identification of projects with the objective to back-up variable electricity generation.

[48] Drawn from European Commission, 2011, Priorities for 2020 and beyond – A blueprint for an integrated European Energy Network



Map 1: Priority corridors for electricity, gas and oil

Box 3: Smart Grids[49]
Smart grids are energy networks that can cost efficiently integrate the behaviour and actions of all users connected to it. They are changing the way, in which the electricity grid is operated in terms of transmission and distribution and re-structuring the present generation and consumption pathways. Through integration of digital technology and a two-way communication system, smart grids establish direct interaction between the consumers, other grid users and energy suppliers. Smart grids could reduce the EU annual primary energy consumption of the energy sector in 2020 by almost 9%, which equals to 148 TWh of electricity or savings reaching almost 7.5 billion euros/year (based on average 2010 prices). Industry estimates for individual consumption argue that an average household could save 9% of its electricity and 14% of its gas consumption, corresponding to savings of ca. 200 euros/year(73). To ensure such an approach and to overcome identified challenges the following key actions are recommended: specific legislation, standardisation and interoperability, data protection, infrastructure investments, demonstration, R&D and innovation projects, promoting new skills to fill the gap between low-skilled and high skill jobs due to smart grid deployment requirements.

[49] Drawn from European Commission, 2011, Priorities for 2020 and beyond – A blueprint for an integrated European Energy Network

Resource efficiency (energy and material) and waste recycling

Energy efficiency is, with the Europe 2020 target of saving 20% of the EU primary energy consumption, at the heart of the transition to a resource efficient economy. It is one of the most cost effective ways to enhance security of energy supply, and to reduce emissions of greenhouse gases and other pollutants. In many ways, energy efficiency can be seen as Europe's biggest energy resource. The three most important energy saving potentials lie (1) in the renovation of public and private buildings and the improvement of energy performance of the components and appliances used in them, (2) in the field of transport and (3) in the field of industry which will be tackled through energy efficiency requirements for industrial equipment, improved information provision for SMEs and measures to introduce energy audits and energy management systems.[50]

All NWE countries mention the improvement and retrofitting of the existing build environment as part of the national reform strategies, as households are responsible for a major part of the energy consumption and because NWE has a large stock of commercial, public and residential buildings older than 1974. In this specific segment there may be significant scope for transnational cooperation, because also the European Commissions considers the public sector to play an exemplary role through an acceleration of the refurbishment rate of public buildings and through an introduction of energy efficiency criteria in public spending.

On EU scale, transport has been the fastest-growing sector since 1990 (figure 3.25) and is now the largest consumer of final energy (33%). The second and third largest consumers of energy are households and industry (see figure 3.25). Household's final energy consumption increased by 1.2% between 1990 and 2004, while the final energy consumption in industry has decreased with 1.4% (and showed an even bigger reduction in the period 2005 and 2009 (-19.0%).[51]

Resource efficiency means using the limited natural resources — metals, minerals, fuels, water, land, timber, fertile soil, clean air and biodiversity — in a sustainable manner, as they all constitute vital inputs that keep an economy functioning and because mankind depends on them for proper survival. **Increasing resource efficiency is also of imminent relevance for territorial development in NWE, because it can bring about major economic opportunities, improve productivity, drive down costs and boost competitiveness and thus secure growth and jobs** (e.g. developing the 'green technology' sector or an opening up new export markets). The topics and sectors to be addresses are quite diverse, ranging from a development of new products and services over finding new ways to reduce resource inputs or minimise waste towards an improvement of the management of resource stocks and a change of consumption patterns or an optimisation of production processes, management and business methods and an improvement of logistics.

According to the Eco-Innovation Scoreboard, NWE countries appear to be above the European average in terms of Eco-innovation performance (cf. figure 3.3)[52]. However, as indicated by the EIO, there is a moderate correlation between relatively high eco-innovation performance and high levels of both per capita material consumption and GHG emissions in Member States, which also holds true for NWE[53]. Focusing on the structural conditions and underlying drivers of resource consumption and emissions in different countries would allow eco-innovation investments to better leverage structural change.

---

[50] European Commission (2011): Energy Efficiency Plan 2011. Communication COM(2011) 109 final, Brussels, 8.3.2011

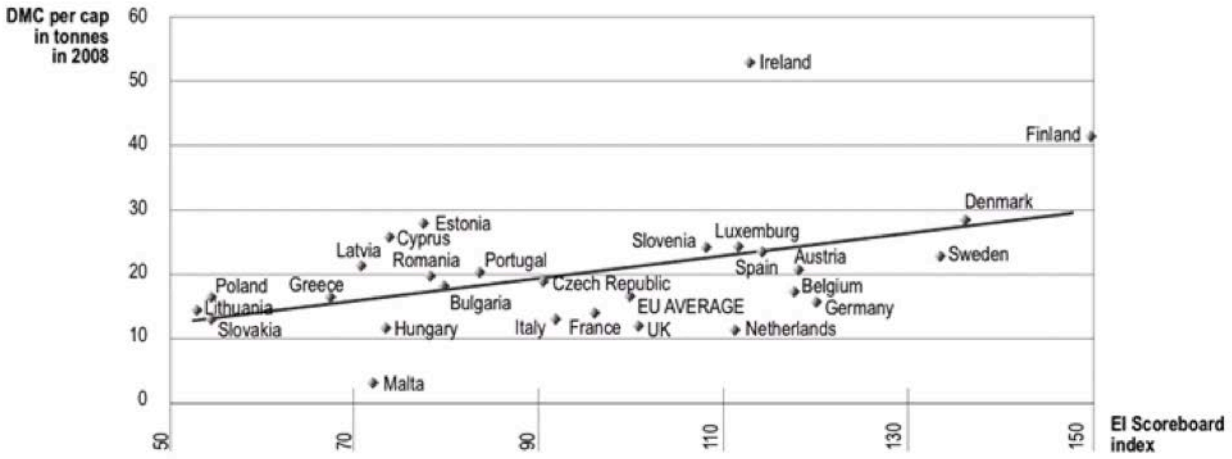
[51] Bureau Buiten, Analysis of Data & Policy Context NWE

[52] The Eco-innovation scoreboard compares the relative performance of EU Member States in key areas related to eco-innovation, including investments, company performance and economic and environmental outcomes. It seeks to reflect the extent to which eco-innovation has penetrated business in each country.

[53] Reasons could include a time lag between innovation and impacts, a focus on clean technologies instead of resource productivity, and a concentration of eco-innovation in niches instead of a widespread diffusion across society

Figure 3.3

Eco-Innovation and per capita material consumption (DMC) in Member States, 2008



Note: 2008 is depicted as it is the most recent year data is available before the financial crisis; the financial crisis led to sometimes significant, but temporary, reductions in material consumption in Member States.

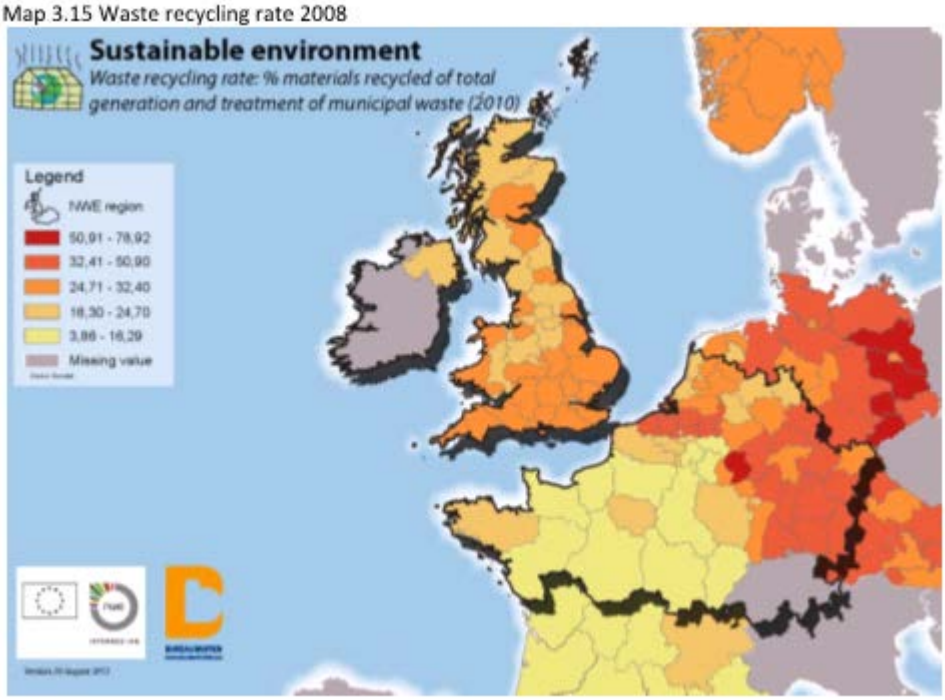
Source: Eco-Innovation Observatory

In the NWE countries, municipal waste generation between 2003 and 2010 remained in most cases stable (LU, BE) or decreased (IE, NL, DE, UK), but in France and Switzerland one can observe an increase. However, except Belgium, all other NWE countries were in 2010 either significantly (CH, LU, IE) or still clearly (NL, DE, UK, FR) above the European average in terms of municipal waste generation. In order to reduce the environmental pressures from landfill (esp. methane emissions and leachates), the EU Directive on the landfill of waste requires Member States to reduce landfill of biodegradable municipal waste to 75 % of the amounts generated in 1995 by 2006, to 50 % by 2009, and to 35 % by 2016. Most of the NWE countries had already met the 2016 target in 2006 (DE, CH, BE, LU, NL) and France was already close by. Only Ireland and the United Kingdom, both with derogation periods, still needed to further reduce landfill of biodegradable municipal waste in order to meet the 2006 target (substantial decrease needed in Ireland). As concerns a **recycling of packaging waste,** one can observe for 2009 that the rates are highest in Germany, Belgium, Switzerland and the Netherlands (> 65%) and slightly lower in France, Luxembourg Ireland and the UK (55-65%)

Within NWE, the percentage of waste that is recycled is slightly growing year by year. Most waste (relatively speaking) is recycled in Germany and Belgium. In absolute numbers, by far most waste is recycled in Germany, the UK and France.

At regional level, the highest material recycling rate is found in most German regions, especially East-Germany, and in Belgium regions (see map 3.15).

Map 3.15 Waste recycling rate 2008



Source: Eurostat, 2008

Greenhouse gas emissions

Total greenhouse gas emissions in the EU27 decreased between 1990 and 2010 by 15.4 %. Emissions increased by 2.4 % between 2009 and 2010, mainly caused by economic recovery from the 2009 recession in many European countries (EEA 2012a). Within the EU15-countries, the largest contribution to the decline in CO2 emissions came from a reduction in both manufacturing industries and construction as well as public electricity and heat production (see figure 3.18). Note that CO2 emission in road transportation is still increasing.

Greenhouse gas emissions mainly consist of CO2 (82%) and the main CO2 sources in the EU15-countries are public electricity and heat production (27%), road transportation (22%), manufacturing industries and construction (14%) and residential (housing areas, 12%).

The NWE countries belong to the major polluters of the EU in terms of greenhouse gas emissions which contribute to global climate change: Germany, the UK and France have the greatest share in the total EU27 greenhouse emission. Reaching the reduction targets established will thus prove to be a difficult task[54] especially in the case of Luxembourg and the Netherlands, given the little decrease which is observed in both countries (in the Netherlands even an increase in emissions is observed between 2005 and 2010). There are, however, significant differences in the national approaches regarding CO2 reduction and the regional and local strategies might even further differ from the national ones and exceed national targets in their ambitions.

Climate change adaptation & risk prevention/management

One among the many challenges[55] and territorial impacts (**see for an overview: Annex 2.5**) that result out of climate change in Europe is **the increase of frequency and scope of extreme natural events and hazards** (e.g. sea level rise, river floods, flash floods, storm surges, heat waves, drought and forest fire etc), which then have significant negative impacts on the areas affected (i.e. loss of human lives, physical & material damages, cost for eliminating damages, cause of other associated technological disasters). Recent ESPON research results on climate change and its aggregate potential impact (i.e. the ESPON 2013 project "CLIMATE") show that in NWE high negative impacts can be expected in larger parts of the Netherlands and Belgium and medium-high negative impacts in France,

[54] The gap between the EU 2020 and national targets regarding CO2 / energy and the current trends is quite big.
[55] see on this in particular: European Environmental Agency (2010): The European Environment – State and Outlook 2010.

Ireland and several coastal regions in the UK. The NWE coastal regions present a remarkably high potential physical impact as a result from climate change, which relates to the density of physical structures such as settlements, transport infrastructure, thermal power plants and refineries in these areas that are mainly sensitive to extreme events.

In the seas that form part of NWE (North Sea, Channel area, Irish Sea, Atlantic), the observed and projected increases in sea surface temperature will lead to the northward movement of species and changes in the distribution of phytoplankton biomass. **Coastal flooding** has already impacted low-lying NWE coastal areas in the past and the risks are expected to increase due to sea-level rise and an increased risk of storm surges. The NWE regions located at the North Sea are particularly vulnerable to coastal flooding, especially in the United Kingdom, Belgium and the Netherlands. The highest coastal flood damage potential which is expected to exceed 3 billion EUR at individual points is heavily concentrated along the coasts of Belgium and the Netherlands, whereas along the coasts of the UK and France or Ireland the expected damage potential is most frequently below one billion EUR and only at some points ranging between 1 and 2 billion EUR.

River flooding is an extreme natural event that is historically experienced in NWE, but data from the EEA environmental report 2010 shows that more recently (1998-2009) the frequency of flood events was very high in the UK and much less so – although still present – on the continent. Forecasts show that NWE will also in the future remain an EU-wide "hot-spot" for extreme flooding events. Increases in winter precipitation are projected to increase the intensity and frequency of winter and spring river flooding, although to date no increased trends in flooding have been observed.[56] Within NWE, the expected future riverine flood damage potential is strongly concentrated on the UK and on the Dutch and Belgian regions bordering the Scheldt Estuary (expected damage potentials ranging from 100 – 280 million EUR).

NWE is also increasingly affected by **heat waves** which, in the past, had either a general extension (2003, 2006) or a more "localised" character (heat waves 2007 and 2010 in Germany, autumn heat wave 2011 in the UK), leading not only to health problems and human casualties but also to drought affecting the agriculture in the concerned areas.

Extreme natural events resulting out of climate **have also a strong urban dimension** because European cities are expected to continue to be vulnerable to heat waves, flooding and droughts which may have significant wide-ranging knock-on effects on infrastructures, public health and the economy (i.e. the water, energy, building and transport infrastructures are particularly vulnerable).[57] Flooding is also expected to take place in urban centres due to the high degree of soil sealing, as the percentage of the population living on urban land that might be exposed to potential floods is estimated in several urban areas of NWE (esp. in Belgium, the Netherlands and in the north and east of France) to range between 6-10% and in some extreme cases even between 10-20% or above 20%.

Environmental protection

The NWE countries belong to the major polluters of the EU especially in terms of air and water pollution and they also face general challenges with respect to a deteriorating quality of their natural environment due to increasing urban land use and growing soil sealing as well as through a further fragmentation of landscapes, which all put pressure on biodiversity..

Air pollution is a real public health problem especially in the densely populated areas (respiratory diseases) and also a major environmental problem that can lead to (among other things) global warming, acid rain, and the deterioration of the ozone layer. The major pollutants are NOx (Nitrogen Oxides, 40%), NMVOC (Non-methane volatile organic compounds, 30%), NH3 (Ammonia, 18%) an SOx (Sulphur oxides 12%). All NWE-countries reported NOx emissions higher than their Gothenburg ceilings 2010, which resulted in the non-achievement of these goals. The territorial

[56] see on this in particular: European Environmental Agency (2010): The European Environment – State and Outlook 2010.
[57] European Environmental Agency (2010): The European Environment – State and Outlook 2010.

dimension of air pollution is first and foremost existing in the in the highly urbanised areas of NWE, where high concentrations of air pollutants can be found: In 2008, most of the NWE cities had relatively high annual mean concentrations of NO2 (20-40 µg/m3) which remained still below or close to the EU limit value of 40 µg/m3, but one city in Scotland exceeded this limit. Compared to this large group of cities, the number of those having clearly lower concentration-levels remains relatively small in number (< 20 µg/m3). Air pollution, as a major source of acidification, also strongly impacts on the ecosystems of NWE (e.g. freshwaters and forests) and the associated risks are highest in the Netherlands (EU-wide leading), followed at much lower levels by Germany, Belgium, the United Kingdom and Luxembourg. In terms of risk, the other NWE countries are clearly below the average of the EEA countries.

Pollution of rivers and lakes and other freshwater resources is still an important issue in NWE which should be addressed by transnational co-operation. NWE is the part in the EU where the annual diffuse agricultural emissions of nitrogen to freshwater are most significant. The core areas with the highest values are the South of Ireland, Northern Ireland, Wales and the South-West and North-West of England in the UK, Bretagne and Normandy in France, most of the Netherlands and the bordering provinces and regions in Belgium and Germany. The annual average nitrate river concentration was highest in the river basin districts in the East of England, followed at a still high level by the river basin districts in many other parts of England, in western France, Belgium, Luxembourg and smaller parts along the German north-western border.

Usual approaches for depicting the territorial footprint of human activity are the observation of **land cover features** and **changes in land use** as well as of **landscapes diversity**:

- As regards **the predominant land cover features in NWE,** the overall situation can be summarised as follows: A high proportion of artificial areas as well as of residential, economic and infrastructure-related areas exists mostly in the densely populated and urban regions of NWE (North-West and Southern England, southern part of the Netherlands, western parts of Belgium, Ile-de-France, north-western Germany), whereas a high coverage with cropland is a particular feature in the South-East and middle of England and especially in most of the French regions. A high level of grassland in agricultural use can be observed in the whole of Ireland and in most of the UK, but in a more diversified manner also in some regions of France, Belgium and the Netherlands as well as in Luxembourg. Higher shares of woodland exist only in the western part of NWE, with a marked role played by all regions in the south-west of Germany and the eastern provinces of Belgium as well as by most of the eastern French regions (with a high level in Franche-Comté) and also by Luxembourg.

- **Land use,** understood as a change in land cover types,[58] shapes our environment in positive and negative ways. Productive land is a critical resource for food and biomass production and land use strongly influences soil erosion and soil functions such as carbon storage. Demand for land is high in NWE, as food and biomass production, housing, infrastructure and recreation all compete for space. This has direct impacts on the climate, on biodiversity and on ecosystem services. The **long-term trends in land cover change (1990-2000, 2000-2006)** show for the NWE countries that artificial land increased in many cases (FR, IE, NL) and only slowed down in some countries (BE, DE, LU), while agricultural land became increasingly under pressure due to uptake by artificial areas (BE, LU, NL) or experienced functional changes due to a loss of different farmland types (FR), withdrawal from farming (IE) or a conversion of pastures into arable land (DE).

- **Urban land use deserves special attention in NWE, because most human activities are concentrated in its metropolitan areas and cities and demand for the urban land-use patterns have a particular impact on the environment** (e.g. through soil sealing or whole sale change of landscapes). Land take for urban area and infrastructure use increased across Europe between 1990 and 2000 by 5.7% and further accelerated during 2000–2006 with an

[58] European Environmental Agency (2010): The European Environment – State and Outlook 2010.

annual land take increase of 0.61%. Within NWE, during 2000-2006, the annual growth of land taken up for urban residential areas and for economic sites was in most countries above the European average (NL, LU, IE) or close to it (FR, DE) and only in one case clearly below (BE). Land take for urban development and infrastructure results in **soil sealing,**[59] mostly of agricultural land, which reduces space for habitats and ecosystems that provide important services like regulation of the water balance and protection against floods, particularly if soil is highly sealed. The degree of soil sealing in NWE is extremely high in Belgium, the Netherlands, Germany, Luxembourg which all belong to the top 7 European countries in this respect (i.e. those having > 5% of the total land areas), whereas the UK (3.3%), France (2.8%) and Switzerland (2.7%) are still above the European average (1.8%) and only Ireland is below (1.6%). Over the past decades, one can observe a **sprawl of economic sites**, creating a mixed signal regarding the sustainability of land use, and also lower population densities in cities - as a result of **residential urban sprawl -** which also induced a variety of other negative impacts on the environment.[60] However, between 2001 and 2004, the population in the 258 largest European city regions grew overall by around 2%, and more than 70% of this increase was in city cores which suggest that people are starting to rediscover the cores of cities as attractive places to live (Urban Audit database).

- As regards **the countryside,** high levels of **landscapes diversity**[61] can only be observed in several areas of the continental part of NWE (esp. Bretagne, Pays de la Loire, Belgium, Luxembourg, north-west and south-west of Germany), whereas in the rest of NWE the diversity is low or even very low (esp. Ireland, UK, most of the Netherlands, major parts of France). The presence of linear elements cutting across the landscape (<3 m wide) contributes to the structuring of the countryside. Amongst them, one can distinguish between "structural" linear elements that are nature-based or human artefacts (e.g. grass and tree margins, shrubs, tiny water courses and dry-stone walls) and pure dissection elements such as fences, electric lines and transport infrastructure. Whereas green linear elements have little impact on landscape disruption, in particular dissection elements resulting from infrastructure development linked to transport and energy infrastructure cause landscape fragmentation and consequently also biodiversity loss. When looking at the intensity of **nature-based structural linear elements,** high ranking NWE countries include those where man-moulded structures of landscapes are well known (e.g. Netherlands, France, Belgium, Luxembourg) or where a mix of man-moulded structures and a diverse set of natural elements are present (e.g. Ireland, United Kingdom), whereas landscapes in Germany are, on average, relatively less intensely structured. As regards the presence of **dissection elements,** high ranking NWE countries include Luxembourg, Belgium, France, the Netherlands and Germany, whereas landscapes in Ireland and the UK are clearly less affected by these elements.

Addressing the challenge of increasing urban land use and growing soil sealing as well as of a further fragmentation of landscapes and of a loss of biodiversity in NWE is thus also a core issue of relevance for transnational co-operation, which could be addressed best through designing and implementing large-scale or place-based integrated policy approaches helping to balance sector demands on land and to manage land use in a sustainable manner, both in the urbanised and in the less urbanised areas.

[59] i.e. the loss of soil resources due to the covering of land for housing, roads or other construction work, which is generally irreversible. These converted areas become highly specialised in terms of land use.

[60] A more disperse location of the population, on the one hand, requires more energy for transport and heating or cooling. The consequences of urban life styles, such as air pollution, noise, GHG emissions and impacts on ecosystem services, are felt within urban areas as well as in regions far beyond them. On the other hand, a person living in a city consumes only 3.5 tonnes oil equivalent (toe) annually compared with 4.9 toe for a rural dweller.

[61] Measured according to the Shannon Evenness Index, which is a multi-level indicator providing information on different types of land cover and their relative abundance (i.e. whether the same
type of land cover recurs in a transect).

Biodiversity, understood as the degree of variation of life forms within a given species, ecosystem, biome or the entire planet, is a measure of the health of ecosystems. Biodiversity is in part a function of the climate[62], but it is also significantly influenced by all kinds of human activity.

- In the European Union, **the Natura 2000 site network** (established by the EU Birds and Habitats Directives) aims to assure the long-term survival of Europe's most valuable and threatened species and habitats. The network has steadily developed over the last 15 years and is now reaching 18 % of the terrestrial area of EU Member States[63], to which the NWE countries contribute quite differently if one looks at the share of Natura 2000 sites in their total terrestrial area: high contributors are the Benelux countries, whereas the other NWE countries - including also Switzerland (only national designated areas) - follow at much lower levels. The terrestrial Natura 2000 sites are also exposed to threats and pressures, which can result out of land-use change (including habitat loss, degradation and fragmentation), pollution, overexploitation, invasive alien species and climate change. The latest EU-wide analysis of Natura 2000 sites, based on land cover change 1990–2006, indicates that, while the vast majority of sites remained with no significant changes to their 1990 pressures from intensive agriculture and urbanisation, changes due to both intensification and withdrawal of agriculture and urbanisation have taken place in a number of sites.[64] In NWE, changes from diffuse pressure from intensive agriculture were particularly strong in Luxembourg (EU-wide leading), but also in some other NWE countries one can observe changes albeit at a significantly lower level (FR, IE). In Germany, France and the Netherlands, one can also observe the strongest decrease of diffuse pressure from intensive agriculture on other Natura 2000 sites. If one looks now at the diffuse pressures from urbanisation, the same picture appears because again Luxembourg is leading and France and Ireland are following at much lower levels.

- Biodiversity is **also an issue in the urbanised areas of NWE**, because urban green infrastructure in cities and around them is important for both biodiversity and the quality of life of the people. Urban ecosystems are highly artificial and provide specific habitats, but they can only survive and deliver good quality of life by using the basic ecosystem services provided by nature and biodiversity, both of which originate from green areas within and outside cities. A look on NWE shows that indeed a lot of "green cities in a green background"[65] can be found, but also as many "brown cities in a green background".[66] Also two other types of cities do quite often exit in NWE, which are the "green cities in a brown background" and the "brown cities in a brown background".[67]

Sustainable transport & removing bottlenecks in key transport infrastructures

Efficient transport, on the one hand, **is fundamental for the smooth operation of the internal market, for the mobility of persons and goods and for the economic, social and territorial cohesion of the EU.** This holds especially true for the transnational co-operation area NWE which hosts, as the economic powerhouse of Europe, a number of regions ensuring a strategic gateway function for international and EU-internal freight and passenger transport and also a highly developed transport infrastructure.

[62] In terrestrial habitats, tropical regions are typically rich whereas polar regions support fewer species. Rapid environmental changes typically cause mass extinctions.
[63] All types of ecosystems are represented within the network, with 38 % of it approximately covered by agro-ecosystems including 11 % that are grasslands, 34 % covered by forests, 16 % by heath and scrub, and 11 % by wetlands. European Environmental Agency (2010): The European Environment – State and Outlook 2010.
[64] European Environmental Agency (2010): The European Environment – State and Outlook 2010
[65] Cities with a relatively high share of public green urban areas and with a green hinterland,
[66] Cities with a relatively low share of public green urban areas, but with a green hinterland as a balancing factor.
[67] In both cases the share green in the hinterland is relatively low, but the shares of public green urban areas are either high or low.

A total of 7 NWE regions rank among the top 20 EU regions which handle through their **sea ports** the highest volume of maritime goods[68] and the highest number of maritime passengers.[69] An even higher number of NWE regions rank among the top 20 EU regions which host **international or regional airports** that handle significant volumes of passengers and air freight in the EU27, some of which are also the EU's central hubs for intercontinental air traffic (London-Heathrow, Paris-Charles de Gaulle, Frankfurt/Main Amsterdam-Schiphol). In air freight transport, most of the NWE countries (esp. Germany, UK, Netherlands, France, Belgium, Luxembourg, Switzerland) even stand out to handle together more than two third of all total air freight volume handled in a European perspective (EU27 & EEA countries & CH). NWE has a well-developed **motorway and railway infrastructure:** The motorway density is highest in the Benelux countries and in several neighbouring regions of Germany (North Rhine Westphalia, Saarland, parts of Rhineland Palatinate) and France (Nord Pas-de-Calais), but also in some parts of the UK (Greater Manchester). Many other NWE regions show medium levels of density and only in the more peripheral or rural regions of several NWE countries the density is clearly lower (i.e. Ireland, Northern Ireland, Scotland, Wales, Cornwall, Dorset, East, Anglia Champagne Ardennes, Lorraine, Tübingen). NWE is one of the two transnational areas which have in terms of territorial extension the densest railway network in the EU (other: Central Europe). Within NWE, the density of railway lines is highest in North Rhine Westphalia and Ile-de-France, while a number of other countries and regions (i.e. Nord Pas-de-Calais Belgium, Luxembourg, several Dutch provinces, Saarland Baden-Württemberg and Hessen) are following them at a somewhat lower level. Moreover, NWE has a **dense and well-developed network of inland waterways** (rivers and channels) especially on the continent which are intensively used for freight transport. The NWE freight transport by inland waterways actually covers a significant share of the total EU27 freight volume transported on inland waterways.

Transport, on the other hand, **is in 2009 by far the largest consumer of final energy in the EU27 and also one of the main sources of pollution and CO2 emissions.** Some transport modes have a lower impact on CO2 emission and on the environment (e.g. railway transport, inland waterway transport[70], maritime transport), while other modes such as air transport and in particular road transport are much more in focus in this respect. For sustainable growth to be achieved in NWE, it is therefore crucial to address from a transnational perspective the complex interplay between the stagnating modal split in inland freight transport and also the territorial implications which result out of the high motorisation rate and the relatively low daily usage of public transport as well as of the strong presence of road congestion in the cooperation area.

Inland freight transport in the EU27 grew continuously between 2000 and 2007 and only marked a drop in 2008 (- 2 %) and 2009 (- 12 %) as a consequence of the economic crisis,[71] but in the same period one can also observe that the **modal split in freight transport** has almost remained static in the EU27. Road transport remains in 2009 with 77.5% the still predominant transportation mode in the EU27 and has even slightly increased in importance (2000: 73.7%), whereas railways and inland waterways account with respectively 16.5% and 5.9% for the rest and saw their shares also slightly reducing (in 2000, with respectively 19.6% and 6.6%). Also in NWE there are no dramatic changes in terms of overall modal split, but it should be noted that some NWE countries showed a slightly more sustainable development in their modal split in freight transport than others: The Netherlands have kept their share of road transport constant between 2000 and 2009 and further increased the shares of railways and inland waterways. Belgium and the UK are other positive examples, as the shares of road transport fell in both countries between 2000 and 2009 and the shares of railways (BE, UK) and inland waterways (BE) increased. The other countries show a less sustainable development which is either more or less in line with the EU27 trend (Germany, Ireland: slight increase of road transport

[68] The by far leading NWE regions in a EU27 context are the Province of Zuid-Holland (ports of Dordrecht, Rotterdam, Scheveningen, Vlaardingen, Zwijndrecht) and the Province of Antwerpen (port of Antwerpen), followed at lower levels by the region Haute-Normandie (ports of Dieppe, Le Havre, Rouen) and the Province of Noord-Holland (port of Amsterdam, Den Helder, Velsen/Ijmuiden, Zaanstad) as well as by East Yorkshire and Northern Lincolnshire region (ports of Trent River, River Hull & Humber Goole, Hull, Immingham) and the region Nord Pas-de-Calais (ports of Calais, Dunkerque).

[69] i.e. Kent (ports if Dover, Medway, Ramsgate), Nord Pas-de-Calais (ports of Calais, Dunkerque)

[70] Compared to other modes of transport which are often confronted with congestion and capacity problems, inland waterway transport is characterised by its reliability, its low environmental impact and its major capacity for increased exploitation.

[71]

and decrease of rail and/or inland waterways) or clearly more accentuated than the EU27 trend: France and Luxembourg both show a strong increase of road transport and a also a marked decrease of rail, but in inland waterways partly a marked increase (FR) or a slight decrease (LU).

The motorisation rate is above or clearly above the EU27 average in larger parts of NWE and below the average only in Ireland, Scotland and in a few isolated spots on the continent (i.e. Ile-de-France, some Walloon provinces and some Dutch coastal provinces). A significantly high number of passenger cars per inhabitant (>0.50) is observed in most of the French regions, in Luxembourg and Switzerland, in south-west Germany as well as in larger parts of England. Conversely, the share of **public transport vehicles** in the total number of passenger road vehicles (e.g. such as buses, trolleybuses and motor coaches) is in NWE only in Ireland and especially in the UK clearly above the EU27 average. Within the UK, there are stark contrasts between regions with a low population density including the Highlands and Islands, West Wales and the Valleys and Cumbria (very high shares) and other much more densely populated urban regions of Inner London and Merseyside (high shares). Generally, however, the United Kingdom stands out in NWE as having high numbers of passenger cars per inhabitant and at the same time a relatively high share of buses, trolleybuses and motor coaches in the total number of passenger road vehicles. On the continental part of NWE, on the opposite, the share of public transport vehicles is in general more or less around the EU27 average or even significantly below and only in Luxembourg and in three provinces of Belgium above the EU27 average. Moreover, a 2011 Eurobarometer survey showed that the actual **daily transport use pattern of people in the NWE countries** is still strongly focussed on individual cars and motorbikes,[72] but much less on public transport[73] and even lesser on non-motorised modes such as walking and cycling.[74]

Road congestion causes enormous cost in the EU (the total costs are estimated at around 120 billion Euro or some 2% of GDP) and has a broad variety of other negative effects.[75] This also holds true for NWE, as all the countries included in the transnational area range at a European scale among the 15 worst countries for traffic across Europe.[76] Congestion and the associated negative effects manifest strongly in the urbanised areas of NWE, where most of the capital cities and the major urban areas either face major or moderate traffic delays. In 2011/2012, the average congestion level in the EU27 (incl. NOR & CH) was 24% and among the top 20 of the most congested cities were also many which are located in NWE. Clearly above the average level are Brussels, Paris, London, Dublin, Bradford-Leeds and Cologne (>26), while Birmingham and Luxembourg are already close to it (>20% and < 24%). Among the top 5 EU cities with increasing congestion is only Bradford-Leeds, whereas among the top 5 EU cities with decreasing congestion one can find Bern and Amsterdam.[77] Important tools for preventing or alleviating road congestion and thus for ensuring more sustainable transport are Intelligent Traffic Management Systems, which are already deployed in most of the larger urban areas in NWE and often also in medium-sized towns and cities. At a transnational scale, NWE was also covered by three of the seven Euro-Regional Projects[78] which aimed to foster a harmonisation and deployment of Intelligent Transportation Systems on crucial parts of the Trans-European Road network and which received support from the EU-programme TEMPO (2001-2006). These projects started the conceptualisation and an initial pilot deployment of combined traffic management/control

[72] with BE, FR, DE, LU, UK, IE > EU27 average; NL < EU27 average
[73] with NL, DE, BE, FR, IE< EU27 average; LU, UK> EU27 average
[74] with NL significantly >EU27 average; DE = EU27 average; BE, UK, IE, FR, LU < EU27 average
[75] Wasting time of motorists and passengers ("opportunity cost"). As a non-productive activity for most people, congestion reduces regional economic health. Delays, which may result in late arrival for employment, meetings, and education, resulting in lost business, disciplinary action or other personal losses. Inability to forecast travel time accurately, leading to drivers allocating more time to travel "just in case", and less time on productive activities. Wasted fuel increasing air pollution and carbon dioxide emissions owing to increased idling, acceleration and braking. Wear and tear on vehicles as a result of idling in traffic and frequent acceleration and braking, leading to more frequent repairs and replacements. Stressed and frustrated motorists, encouraging road rage and reduced health of motorists. Emergencies: blocked traffic may interfere with the passage of emergency vehicles travelling to their destinations where they are urgently needed. Spill-over effect from congested main arteries to secondary roads and side streets as alternative routes are attempted ('rat running'), which may affect neighbourhood amenity and real estate prices.
[76] Ranking according to the "INRIX Traffic Scorecard", which provides a comprehensive analysis of the state of traffic congestion across the world. http://www.inrix.com/scorecard/summary.asp
[77] TomTom International BV (2012): TomTom European Congestion Index. http://www.tomtom.com/lib/doc/congestionindex/2012-0704-TomTom%20Congestion-index-2012Q1europe-mi.pdf
[78] i.e. "STREETWISE" covering the UK and Ireland; "CENTRICO" covering the Benelux, northern France and north-western and southern part of Germany; "SERTI" covering eastern France, south-west Germany, western Switzerland, Italy and Spain.

and traveller information systems at a cross-country scale and are still relevant for a further development in the current period.

In the wider perspective of the sustainable growth objective, the above-said suggests that the need for a removal of bottlenecks in key network infrastructures is less important NWE. Instead, more efforts should be made to achieve a more efficient traffic management on the major transport axes for reducing congestion and to encourage a stronger shift towards more environmentally friendly modes of transport. This is particularly evident in the urban areas of NWE, where a mixed strategy of public transport, walking and cycling and electric transport is an obvious ambition for NWE which may also offer scope for transnational cooperation.

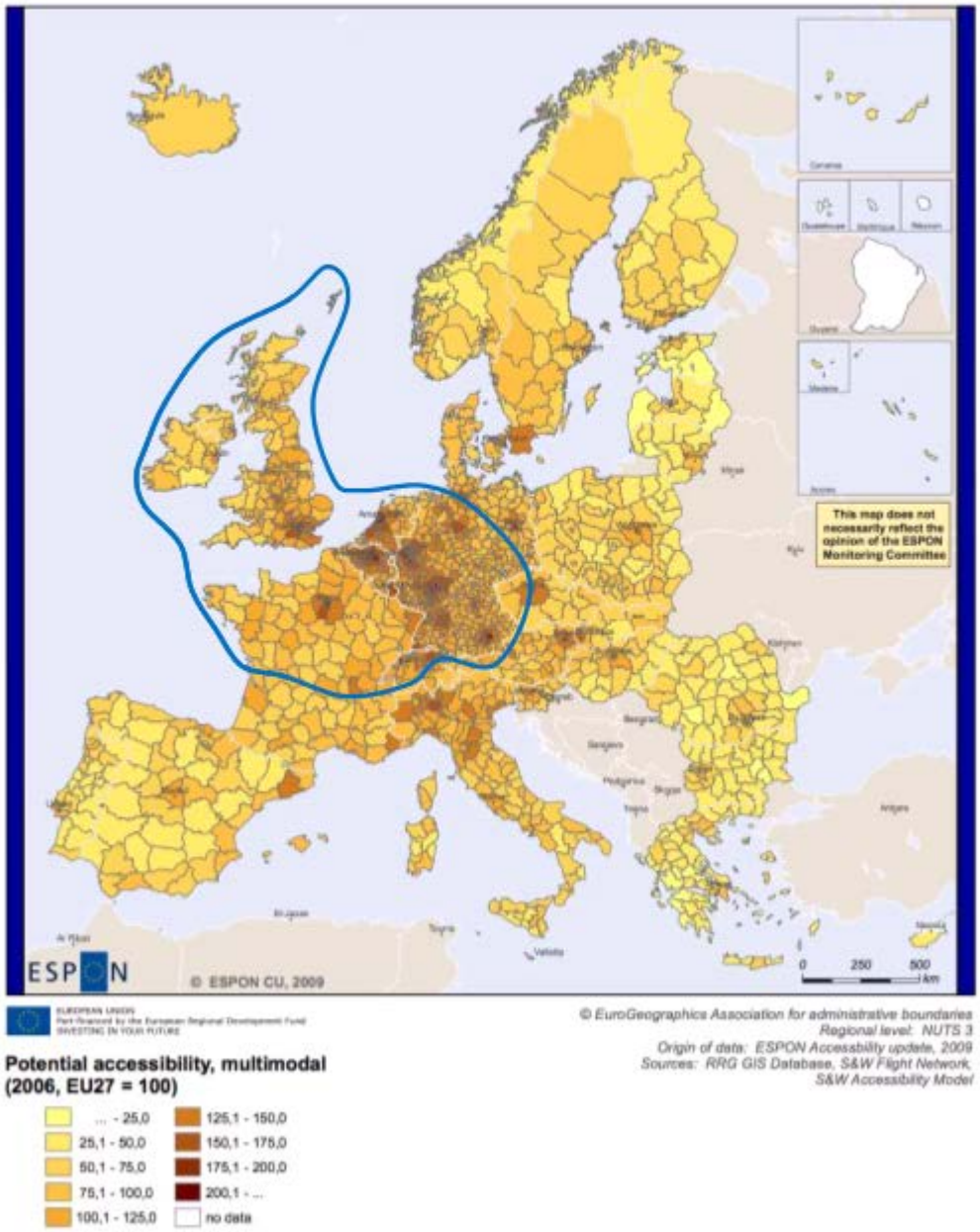
Accessibility

Accessibility can be measured by the number of people that can be reached within 30 minutes of travelling. Multimodal transport is a combination of different modes of transport (e.g. road and rail transport).

Transport infrastructure and transport service developments during 2001-2006 have increased the overall accessibility of European regions and cities, with the highest improvement found in rail accessibility. New high-speed rail and air services have improved the accessibility of some regions outside the core area (Pentagon) supporting a polycentric pattern.

Economic development of a region is often related with potential accessibility. In general, regions with a high accessibility are most often also economically and competitively successful Map 7 shows the accessibility scores for multimodal, road and rail transport at a NUTS3 level.

MAP 7 – Multimodal accessibilty (ESPON Accessibility Update) for the TNC North West Europe



We see that areas within the NWE that have the highest population density also have the highest accessibility. These areas are located in the 'blue banana', Europe's most populated area and transport corridor. Adjacent regions and regions in between large population agglomeration profit from this high accessibility. **Nevertheless we also see areas in NWE with quite a low accessibility. These areas can mainly be found in less populated and remote areas such as Normandy, Scotland and Ireland**.

Looking at the accessibility by train it can be noticed that the urban areas and especially those areas that have a well developed and connected train network (the Netherlands, Belgium, the Ruhr area) show the highest accessibility by train. It is important to keep this high train accessibility in mind in light of more sustainable modes of transport, as a higher share of train use can limit the amount of total transport emissions.

5.2. Additional territorial considerations of Sustainable Growth in NWE

The previous paragraphs began to illustrate the importance of the territorial dimension of sustainable growth indicators (e.g. accessibility, transport). The following sections present additional territorial considerations which must be taken into account when designing transnational policy support in the field. The importance of the territorial dimension of sustainability indicators is twofold:

- The European Union is about to undergo a paradigm shift with respect to how energy is produced, transmitted, distributed and traded because it attempts to reduce the carbon footprint of the energy sector as a whole.[79] **The territorial dimension of energy policy is therefore becoming more important especially in the field of energy infrastructure planning and the envisaged shift towards a further production and consumption of renewable energy**. The success of territorial initiatives in the field of energy planning such as the Covenant of Mayors clearly illustrates the importance of the territorial dimension of this particular subject.
- In addition, **there are significant differences within NWE territories in terms of adaptation and mitigation capacities to climate change** that need to be taken into account when defining priority topics and actions under the 'sustainable growth' objective. Generally speaking, NWE regions with high vulnerability to climate change events (e.g. flooding) are well prepared to face these challenges due to a high adaptive capacity. On the other, NWE hosts a high number of regions with high GHG emissions and high mitigative capacities. This dimension is clearly illustrated by the work carried out in the framework of ESPON projects such as CLIMATE and TRANSMEC.

The ESPON project CLIMATE has produced territorial evidence with regard to the differences among territories in terms of their vulnerability to natural hazards and climate changes, and their ability to effectively respond to these in order to prevent damage or injury.

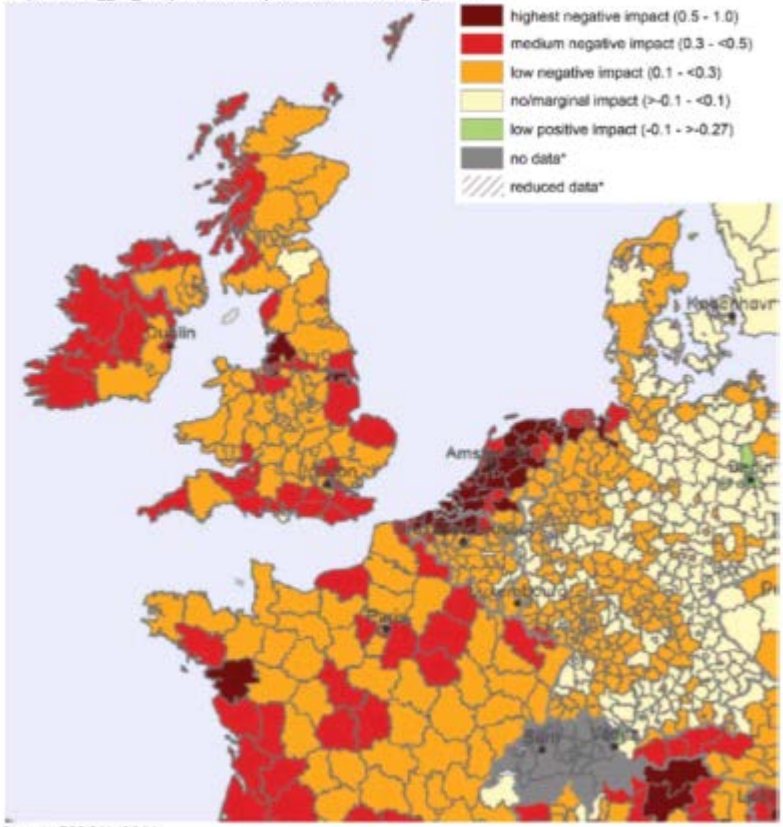
The potential impact (map 3.11) of climate change varies across NWE. Large parts of the Netherlands and Belgium have to deal with potentially high negative impacts of climate change, together with medium high impacts in France, Ireland and several coastal regions in the UK. The figure demonstrates that NWE coastal regions show a remarkably high potential for physical impacts as a result from climate change.

The NWE area ranges among the European areas with the highest amount of floods in urban areas. The combination of a high degree of urbanisation together with a high amount of river basins with a considerable flood history leads to the fact that NWE is the region where the urban vulnerability to flood events is the highest in Europe[80].

[79] This paradigm shift will increase the role of electricity compared to other energy vectors (including notably also a substantial strengthening of the share of renewable energy sources) and further integrate the European energy market, while also ensuring continuous security of energy supplies notably from gas in the context of an increasing dependency on imported fossil fuels.

[80] Transmec final report

Map 3.11 Aggregate potential impact of climate change NWE



Source ESPON, 2011

The capacities of countries and regions to deal with these impacts vary as well. The CLIMATE study identifies 2 main strategies (see also figure 3.27):

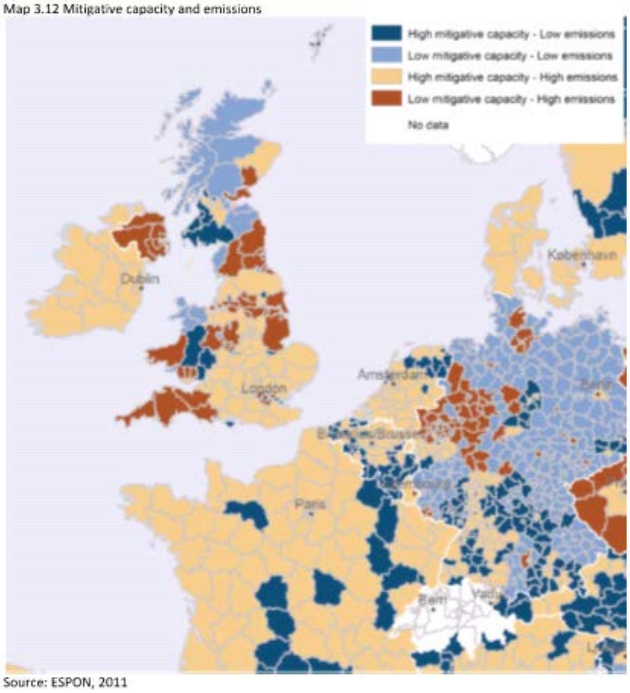
- Mitigation: soften and prevent climate change effects, decreasing greenhouse gas emissions. A low mitigation capacity implies a.o. vulnerability to fluctuations to energy costs and security and as a result a negative impact on competitiveness. A low mitigation capacity is seen in parts of the UK and Germany.
- Adaptation: respond on climate change effects for example adapting water systems, behaviour, etc. Adaptation and includes adjustments in both behaviour and in resources and technologies. Low adaptive capacity is seen in parts of the UK, Ireland and France.

In combination with the relative amount of greenhouse gas emissions, this results in recommendations for action in the following regions (see also table 3.1):

- B. Regions with both high mitigative capacity and high levels of greenhouse gas emissions (light brown in map 3.12 - many places in NWE);
- D. Regions with low mitigative capacity and high emissions (dark brown in map 3.12 – parts of UK and Germany).
- F. regions with low adaptive capacity and a high mitigative capacity (grey-green in map 3.13 – parts of the UK, Ireland and France)
- H. regions with both low adaptive and mitigative capacity (light grey-green in map 3.13 – parts of the UK and northern Germany);

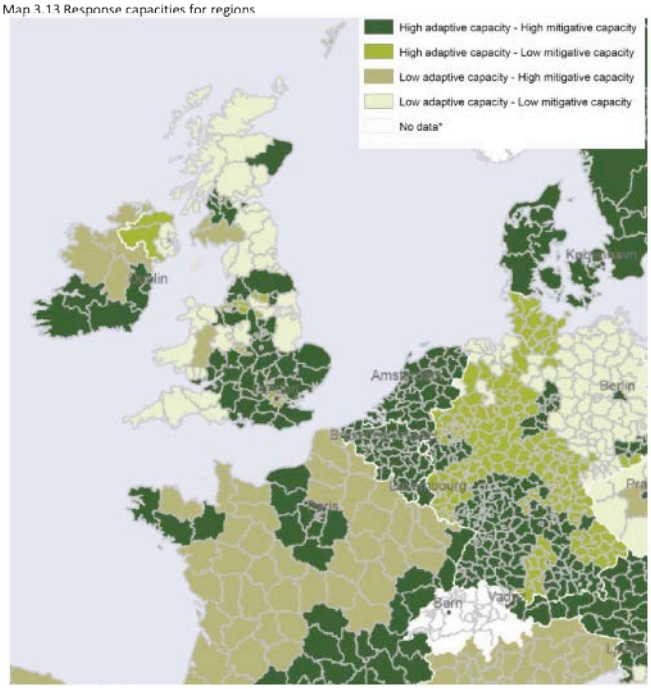
The (D) type of regions are the major problem regions where most effort is needed. These kinds of regions are situated across the UK and Germany. Recommendation from the ESPON Climate study is to facilitate the development and uptake of cleaner technologies (increase mitigative capacity) as well as implementation of policies.

Map 3.12 Mitigative capacity and emissions



Source: ESPON, 2011

Map 3.13 Response capacities for regions



Source: ESPON, 2011

The recommendation from the ESPON Climate Study is to place more effort on decreasing net greenhouse gas emissions, stressing the preventive nature of climate policy (the implementation of mitigation policies). This is specifically relevant for the B type of regions, including large parts of the Netherlands, Belgium, France, Ireland and UK.

The conclusions on of the Climate project also point to the need to rethink the funding of adaptation actions in the NWE programme. The project illustrates that the Centre and **North of Europe governance and population know very well how to react in case of a disaster actually taking place (high adaptive capacity)**. Therefore the **'vulnerability' in NWE is low**, except for a few exceptional mainly coastal regions in Netherlands, Belgium, France and UK. The opposite can be said from the South of Europe where in almost all regions not enough precautionary measures have been taken to prevent serious impact of hazards (such as fire).

The scarce financial means under the Transnational cooperation Programme NWE could thus be better redirected from 'Adaptation to Climate Change' towards other territorial challenges or other opportunities[81].

[81] Final Results analysis IVB NWE, 2012

Topics relating to the "Sustainable Growth Objective" of Europe 2020 (i.e. actions on competitiveness, combating climate change & clean & efficient energy)				
	STRENGTHS	**WEAKNESSES**	**OPPORTUNITIES**	**THREATS**
Supporting the shift towards a low-carbon economy in all sectors	• Existence of a broad public and political awareness in NWE (as a window of opportunity) on a necessary shift towards a low-carbon economy. • On the production side, the share of renewables has increased vastly in DE, LU. On the consumption side, the share of renewable is still limited in NWE and in all countries – except France - below the EU27 average. • Scientific solutions exist in NWE, but also concrete examples for a more "place-based" (local) and cheaper energy provision through a use of renewable energy sources.	• The share of renewables in energy production and consumption is below EU 27 average in all of NWE countries except Germany. • Negative influence of external behaviour in this context (Why should we do it if China or the US is not doing it?). New solutions (scientific & technical) are still too costly. Also negative externalities such as e-pollution associated to electricity grids are mobilising people to reject or delay energy infrastructure projects. • Energy infrastructures (grids) are often outdated and also poorly interconnected in a cross-country perspective. Necessary investments in energy infrastructures are not taking place (or not as quickly as needed), notably due to the current regulatory framework and other procedural aspects. • Still existing hurdles to deliver alternative energy production (e.g. solar & wind energy) to the networks/grids. • Low solar potential of the NWE region	• Regarding energy efficiency, there may be significant scope for transnational cooperation on improving and retrofitting the existing built environment. There is much potential for improving energy efficiency in buildings (including both the private and public sectors). • The gap between EU2020 targets and national targets regarding sustainable energy and CO2 reductions is significant. A strategy could include eco-innovation as well as the implementation of proven technologies and applications. • Further stimulate a change in behaviour and also an even broader public acceptance of the low carbon shift. • The territorial dimension of energy production and consumption from renewables offers scope for cooperation in the development of strategies for renewable energy production, energy efficiency of existing buildings, transport, SME's and eco-innovation. • Realisation of supporting actions having a "place-based" approach / territorial focus, which assist the regions and stakeholders especially in framing the implementation of energy infrastructure projects of European interest, can speed up the deployment of such infrastructure projects. • Transnational cooperation may bring opportunities in the development of efficient and sustainable transnational infrastructures for renewable energy • Very high wave power potential of the NWE region	• Loss of public and political acceptance due to significant cost-raising effects resulting from a low carbon-oriented energy provision. • Growing public indebtedness and also a continuation of lengthy and uncertain permitting procedures will significantly hinder the required future deployment of efficient and smart energy infrastructures. • Continuing absence of alternative and cheaper solutions for a more local/place based energy-provision on ground of renewables and further raising energy process for consumers.

			• NWE is directly concerned by a number of European priority corridors for future infrastructure development in the field of electricity, gas and oil (e.g. North Seas Offshore Grid)	
Promoting climate change adaptation, risk prevention and management	• An EU-legal framework with objectives for CO2 reduction and also national policies on CO2 reduction are in place. • A number of risk management networks and also (technical solutions) are in place in NWE (esp. river flooding). • NWE hosts an high concentration of regions with high mitigative capacity • The Centre and North of Europe governance and population know very well how to react in case of a disaster actually taking place (high adaptive capacity). Therefore the 'vulnerability' in NWE is low, except for a few exceptional mainly coastal regions in Netherlands, Belgium, France and UK. •	• NWE countries belong to the major polluters of the EU in terms of greenhouse gas emissions which contribute to global climate change: Germany, the UK and France have the greatest share in the total EU27 greenhouse emission. • NWE is already exposed quite often to extreme natural events (e.g. coastal floods, river floods, storm surges, heat waves, drought etc) which have significant negative impacts on the areas affected, • Weaknesses in national/regional governance of risk still exist in NWE. • NWE is the region where the urban vulnerability to flood events is the highest in Europe	• Stronger exploration of "place-based" (or bottom-up) approaches which increase the mitigation capacity and especially the adaptive capacity in NWE, for increasing the fighting negative impacts of climate change (e.g. sea level rise, flooding, heavy weather incidents). • Explore the commercial opportunities of efficient solutions existing in NWE, for transferring those to the rest of the EU and even world-wide (in relation to OT1 and 3)	• Increase of natural risks due to climate change (e.g. sea level rise and increase of frequency & scope of extreme events such as coastal floods, river floods, urban floods, storm surges, heat waves and drought etc) and significant increase of cost to eliminate the damages caused by such events, especially in the NWE countries and regions most affected (Netherlands, Belgium, France, the UK & Ireland). • The NWE coastal regions present a remarkably high potential physical impact as a result from climate change, which relates to the density of physical structures such as settlements, transport infrastructure, thermal power plants and refineries in these areas that are mainly sensitive to extreme events
Protecting the environment and promoting resource efficiency	• NWE has a good history of water management expertise that can also be transferred EU-wide and globally. • For the reducing landfill of biodegradable municipal waste, most of the NWE countries had already met the 2016 target in 2006 (DE, CH, BE, LU, NL) and France was already close by. • Better than average systems & technologies for waste management exist in NWE. • Annual growth of land taken up for urban residential areas and for economic sites was clearly below the European average only in BE. • Lower degrees of soil sealing in the UK, France, Switzerland and especially in	• NWE countries belong to the major polluters of the EU in terms of air pollution. All NWE-countries reported NOx emissions higher than their Gothenburg ceilings 2010. Poor air quality results in health problems (respiratory diseases) especially in the densely populated areas. • Pollution of rivers and lakes and other freshwater resources is still an important issue in all NWE countries, because of intensive agriculture and an increased economic activity. • Except Belgium, all NWE countries were in 2010 either significantly (CH, LU, IE) or still clearly (NL, DE, UK, FR) above the European average in terms of municipal waste generation.	• To address the challenge of increasing urban land use and growing soil sealing as well as of a further fragmentation of landscapes and of a loss of biodiversity in NWE, large-scale and/or place-based integrated policy approaches can be designed which help to balance sector demands on land and to manage land use in a sustainable manner, both in the urbanised and in the less urbanised areas. • Biodiversity should also be increasingly addressed in an urban context, because NWE hosts many cities with low public urban green areas and/or green hinterlands. • Creating more "place-based" solutions for a promotion of resource efficiency (development, piloting & testing). Better	• Further deteriorating air quality due to further increase of intensive agriculture of economic activity population and of individual passenger traffic and terrestrial freight transport. • Increasing urban sprawl. • Regional disparities and urban rural differences are increasing, contributing to negative spatial development trends, despite policy frameworks to achieve better spatial balance and quality. • Lack of policy efforts especially in the densely populated areas of NWE, leading to a further increasing pressure on the environment and/or a stronger deterioration of environmental quality.

	Ireland. • In the countryside, high levels of landscape diversity in several areas of the continental part of NWE (esp. Bretagne, Pays de la Loire, Belgium, Luxembourg, north-west and south-west of Germany). Presence of dissection elements in landscape is lower in Ireland and the UK. Positive for biodiversity. Good experience with natural resources management exists in NWE. • High contributors to the Natura 2000 site network are the Benelux countries (in % of in their total terrestrial area). • In DE, FR and NL, the strongest decrease of diffuse pressure from intensive agriculture on Natura 2000 sites is observed. • Some regions have implemented good solutions for promoting resource efficiency which have a potential for transfer • Within NWE, the percentage of waste that is recycled is slightly growing year by year.	• Annual growth of land taken up for urban residential areas and for economic sites was in most countries above the European average (NL, LU, IE) or close to it (FR, DE). • Extremely high degree of soil sealing in Belgium, the Netherlands, Germany, Luxembourg (i.e. > 5% of the total land areas). • In the countryside, levels of landscape diversity in the rest of NWE are low or even very low (esp. Ireland, UK, most of the Netherlands, major parts of France). • Presence of dissection elements in landscape is high in Luxembourg, Belgium, France, the Netherlands and Germany. Here, a loss of biodiversity is existing. • All other NWE countries - including also Switzerland (only national designated areas) – contribute at much lower levels to the Natura 2000 site network. • Diffuse pressure from intensive agriculture & urbanisation on Natura 2000 sites was particularly strong in LU (EU-wide leading), but also at a significantly lower levels in FR, IE. • NWE has a large stock of commercial, public and residential buildings older than 1974 with a low energy efficiency • Strong urban dimension of the NWE area which is linked to specific urban climate phenomenae such as urban heat islands	use of waste for raw material recovery and energy production. Opportunities for new material development from waste. • Pollution of rivers and lakes and other freshwater resources is still an important issue in NWE which should be addressed by transnational co-operation (flows) • Transnational cooperation may be promising to the support of the transnational dimension of EU law and policies (e.g. cross border dimension of Natura 2000 sites, maritime spatial planning, water management)	• Further increase of raw material cost, having negative impact on the economy and individual households. • Further dependence on foreign material resources • In the seas that form part of NWE (North Sea, Channel area, Irish Sea, Atlantic), the observed and projected increases in sea surface temperature will lead to the northward movement of species and changes in the distribution of phytoplankton biomass • Increased health problems due to water, air and soil pollution, affection especially marginalised populations • Urban land use deserves special attention in NWE, because most human activities are concentrated in its metropolitan areas and cities and demand for the urban land-use patterns have a particular impact on the environment
Promoting sustainable transport & removing bottlenecks in key network infrastructures	• Transport is of vital importance for economic growth in NWE. • High quality transport networks exist in NWE for all modes mostly in the core area (rail, road, air, sea, inland waterways). • Innovative traffic management solutions are introduced in many NWE cities and	• Transport is a major source of pollution and CO2 emissions in NWE. • NWE remains heavily reliant on road transport. • The motorisation rate is above or clearly	• Developing a common governance strategy in NWE for secondary networks. • Explore opportunities for a “de-growth” of traffic in NWE: More efficient traffic management on major transport axes and in the major urban agglomerations of NWE for reducing congestion.	• Transport remains a major source of pollution and CO2 emissions in NWE. • Further increasing CO2 emissions and overall economic losses in NWE due to increasing transport and traffic congestion.

	also across parts of the transnational area which have a potential for further development and transfer. • High level of accessibility of many of the NWE areas linked to the high levels of urbanisation and concentration of population	above the EU27 average in larger parts of NWE • The infrastructure density is lower in the more peripheral or rural regions of several NWE countries. • The existing road infrastructure in NWE is heavily congested especially in the core area, because the dominant mode for freight transport is the road and because individual car use is still the dominant pattern of transport of persons. Negative effects of road congestion materialise especially in the most urbanised areas of NWE. Public transport and other non-motorised traffic modes are proportionally less important in NWE. • Transport is very low on the priority list of the EC for use of structural funds in NWE countries • There are areas in NWE with quite a low accessibility. These areas can mainly be found in less populated and remote areas such as Normandy, Scotland and Ireland.	Encouragement of a stronger shift towards more environmentally friendly modes in the field of freight transport (rail, inland waterway transport) and passenger transport (public transport). Exploring new opportunities for expanding "slow traffic" especially in urban areas of NWE. • Transnationality may be promising for the facilitation of seamless mobility across NWE (e.g. through integrated ticketing services)	• Increasing population growth especially in the urban areas of NWE and increasing congestion in these areas.

5.3. Conclusions for the Sustainable Growth Objective

What are the main lessons from the current Interreg IVB NWE programme?

The following paragraphs provide a picture of some of the IVB programme's main outputs until 2012. Even though these figures provide a preliminary indication with regard to the types of projects being funded, it is important to keep in mind that they illustrate the stock of projects at a given point in time, rather than the flow throughout the programme's lifetime.

The large majority of IVB NWE projects are aimed at addressing objectives related to the sustainability agenda, covering energy, climate and transport topics. The NWE programme has thus developed a strong reputation in the field of sustainability.

The three investment priorities with the highest number of projects are 4c (supporting energy efficiency and renewable energy use in public infrastructures and in the housing sector), 7c (developing environment friendly and low carbon transport systems and promoting sustainable urban mobility) and 5a (supporting dedicated investment for adaptation to climate change).

Where could transnational cooperation be of added value and under what conditions?

Generally speaking, the NWE is on a similar level as the EU27+4 standards when it comes to the main indicators for sustainable growth (wind energy potential, ozone concentration and potential vulnerability to climate change). However, as is the case with smart growth indicators, the NWE territory displays significant levels of heterogeneity among member regions.

Transnational cooperation could thus be a useful tool in addressing one general challenge and several specific related challenges. These are presented in the following paragraphs in order of their relevance for the VB NWE programme:

1. **Mitigating climate change and reducing GHG emissions:** This is a general challenge for the NWE which can only be reached by addressing a subset of more specific issues. The NWE area hosts an important number of territories with high mitigative capacities and high GHG emissions. Transnational cooperation may allow to tap into the mitigation potential of these regions in light of reducing potential climate change risks**. The additionality of transnational cooperation in the NWE area is in principle higher when it comes to mitigation actions rather than adaptation actions**.

2. **Increasing resource efficiency**: As is the case of other European countries, there is still a significant challenge regarding the de-coupling of economic growth and resource consumption. In the NWE area, part of this solution lies within the optimisation of resource use and consumption through for example industrial symbiosis schemes and the implementation of closed circuits (e.g. water). Increasing resource efficiency can bring about major economic opportunities, improve productivity, drive down costs and boost competitiveness (securing jobs and growth). Transnational cooperation aimed at supporting resource efficiency would be a good complement to Regional Operation programmes which will be strongly focused on renewable energy production and consumption.

   In addition to material efficiency, energy efficiency is an important component of resource efficiency. Due to the high building stock of the NWE, collaboration could take place in order to improve and retrofit the existing built environment in order to improve energy efficiency.

   Finally, measures to increase resource efficiency could focus particularly SMEs. Transnational cooperation could provide a means of stimulating the uptake of resource efficient solutions by SMEs, thus establishing a link between sustainability and growth.

3. **Increasing the share of renewable energies in the production and consumption mix**: The share of renewables in energy production and consumption is below EU 27 average in all of NWE countries except Germany. Transnational cooperation may bring opportunities in the development of efficient and sustainable transnational infrastructures for renewable energy production and distribution (e.g. smart grids). The NWE area is directly concerned by a number of European priority corridors for future infrastructure development in the field of electricity, gas and oil (e.g. North Seas Offshore Grid). It is worth highlighting that NWE coastal regions possess a very high potential for wave power generation. In addition, the EU Maritime Strategy for the Atlantic Area provides a valuable basis for the development of joint actions in the field of environmental protection, energy efficiency and renewable energy.

   However, the added value of transnational cooperation in the promotion of renewable energy production may be limited due to the heavy investments required to develop production and distribution infrastructure (limited financial capacity of the programme). Instead, cooperation should focus mainly on the 'soft' aspects of renewable energy development such as ensuring more efficient and transparent permitting procedures, financing feasibility studies, increasing public acceptance and further speeding up the overall infrastructure deployment process. Further, transnational cooperation should focus primarily on renewable energy demand stimulation rather than supply.

   There is a risk for transnational cooperation programmes to overlap with a number of other initiatives aimed at promoting the development of renewable energies at other levels: Regional Operational Programmes in developed regions have the obligation to earmark at least 20% of ERDF funds in renewable energy and energy efficiency. Other European initiatives such as Intelligent Energy Europe also already provide financing opportunities for the 'brains' necessary to carry out renewable energy projects.

4. **Strengthening the management and protection of natural resources:** Pollution of rivers and lakes and other freshwater resources, as well as of coastal is an important issue in NWE which could be addressed by transnational co-operation. Transnational cooperation may be promising in the support of the transnational dimension of EU environment law and policies (e.g. cross border dimension of Natura 2000 sites, maritime spatial planning, water management). There are increasing pressures related to urban sprawl, which affects biodiversity, landscapes and natural resources.

5. **Improving the transport mix and finding innovative ways to decrease transport (e.g. multimodality and new production methods)**: The NWE area hosts a strongly developed transport network, allowing territories to benefit from high levels of accessibility. However, the area remains heavily reliant on road transport and the motorisation rate is above or clearly above the EU27 average in larger parts of NWE. In addition, the infrastructure density is lower in the more peripheral or rural regions of several NWE countries. Transnational cooperation may be a means of exploring opportunities for a "de-growth" of traffic in NWE through more efficient traffic management on major transport axes and in the major urban agglomerations and encouragement of a stronger shift towards multimodality and more environmentally friendly modes in the field of freight transport (rail, inland waterway transport) and passenger transport (public transport). The transnational approach could also be of added value in the facilitation of seamless mobility across NWE (e.g. through integrated ticketing services).

   However, as is the case with renewable energy promotion, the added value of transnational cooperation in the field of transport may be limited due to the heavy investments required to develop infrastructure (limited financial capacity of the programme). This could explain in part why the current programme has faced difficulties in attracting transport-oriented projects. In addition, transport is heavily dependent on national policy cycles. When interregional collaboration can be of added value, it is more on the basis of cross-border rather than transnational collaboration.

In light of the above, evidence supports focussing primarily on Thematic Objective 6 (protecting the environment and promoting resource efficiency) and 4 (supporting the shift towards a low carbon economy in all sectors) and. Policy evidence on the other hand does not point towards the need to focus on transport as a priority. This is illustrated by the fact that TO7 is not mentioned as a priority in any of the Commission's position papers on the development of partnership agreements with NWE countries. TO5 (promoting climate change adaptation) is excluded because territorial evidence points to the fact that there is a higher need for mitigation support actions rather than adaptation support in the NWE area.

6. SWOT analysis for the Inclusive Growth Objective

A socially inclusive society is generally defined as one where all people feel valued and where their differences are respected and their basic needs are met so they can live in dignity. Social exclusion, on the opposite, is generally understood as a process where people become disconnected from the social, economic, political and cultural systems which contribute to the integration of a person into the community.

Within the Europe 2020 Strategy, the inclusive growth objective means (…) *empowering people through high levels of employment, investing in skills, fighting poverty and modernising labour markets, training and social protection systems so as to help people anticipate and manage change, and build a cohesive society. It is also essential that the benefits of economic growth spread to all parts of the Union, including its outermost regions, thus strengthening territorial cohesion. It is about ensuring access and opportunities for all throughout the lifecycle.*[82]

Inclusive growth indicators draw a **positive picture for the long-term unemployment rate in North West Europe and a similar picture as the EU27+4 for people at risk of poverty and persons with upper secondary or tertiary education attainment**. But especially in questions of employment and labour force the **high disparities within the programme area have to be considered**. The north and the east of the TNC area display higher employment rates than the rest of North West Europe. Also the potential change in labour force until 2050 shows a diverse picture[83].

In general, the NWE area 'scores' above or around EU average regarding employment and education. Only France and Ireland present employment numbers below average. Regarding risk of poverty, Ireland and the UK present numbers below the EU 15 average.

There are also considerable differences in levels of education across NWE, which may further the risk of social inequalities and exclusion. There are local and regional exceptions (on NUTS 2 level), however, that deviate both positively and negatively from these general trends.

Employment growth is an important aspect for all countries and regions of NWE. Overall, for NWE, unemployment, especially for certain groups (older, under skilled, young) is of increasing concern and may lead to further social inequalities in society and regional disparities across NWE. All four ESPON DEMIFER scenarios predict the highest negative values for potential change in the east of NWE, while the north-west (except the very north of Great Britain) could experience positive percentages of persons in labour force in the next decades.

Deaths from diseases (cancer, infections, asthma) are particularly high in the Netherlands and parts of France, the north of the United Kingdom and Ireland. This fact might be related to the high costs per capita related to public health care particularly in the Netherlands. Moreover, especially respiratory diseases may be connected to levels of air pollution (e.g. around major transport corridors). Public health and quality of housing and the built environment are also a concern in several of the spatial strategies in the countries and regions of NWE[84].

Employment & labour mobility

Under the conditions of demographic change and an already starting shrinkage of the working-age population in the EU, potential compensatory policy options are (1) a raising of the overall employment rate and of the employment rates of women and elderly people, (2) a reduction of the youth unemployment rate and a better work integration of other social groups excluded from the labour market (e.g. long-term unemployed, non-EU born immigrants, disabled persons), (3) a

[82] Commission of the European Communities (2010): EUROPE 2020 op. cit., p.16.

[83] Espon TERREVI project, Factsheet for the Nort West Europe Transnational Cooperation Area

[84] Bureau Buiten, Analysis of Data & Policy Context NWE

stimulation of EU-internal labour mobility and finally (4) a further increase of external migration towards the EU.

If compared to the Europe 2020 headline target of 75 % of the population aged 20-64 being employed, one can observe that the **overall employment rates in the NWE-countries** are in general close to the Europe 2020 targets as set in the National Reform Plans 2011.[85] At the regional level, however, high employment rates (> 67%) are found in many regions of the continental part of NWE (Netherlands, northern Belgium, Germany) and also in larger parts of the UK (esp. south east of England, but also northern England and parts of Scotland). Medium-high employment rates (57%-67%) are observed in Luxembourg, Ireland and in larger parts of France, but also in some parts of the UK (esp. Wales). Within NWE only a few "hot-spots" with employment rates below 57% do exist in northwest France and in the centre, south and west of Belgium. The shifts in regional employment rates between 2008 and 2010 suggest, however, that in particular Ireland and the UK had been strongly affected by the economic crisis in these years, whereas on the continental part of NWE the negative effects on employment were with a few exceptions not this strong.

The level of **female employment in NWE** is above the EU average (58.5%) in the whole of the Netherlands and in all German regions as well as in nearby all of the UK (except Northern Ireland) and in Switzerland, whereas levels slightly below or above the EU27 average are found in the whole of Ireland and Luxembourg. France and Belgium are somewhat divided in this respect, with above-average levels existing mostly in some Flemish provinces and in the French hinterland regions and levels slightly below or at the EU27 average existing in most of the Walloon region and in the northern French border regions (except Alsace).

The **employment rate of elderly people** aged 65 years and over increased, between 2006-2011 in NWE, at a path that was above the EU15 average and also above the EU27 average, but this seems to be clearly a national phenomenon in NWE. This is because high levels are mostly observed in Ireland, the UK and Switzerland (6-13.4%), whereas average levels exist in Luxembourg, Germany and the Netherlands (3-6%) and lower levels in most of France (0-3%).

Unemployment

Within NWE, unemployment (25 years and over) rose substantially in Ireland since 2007 and onwards. At the beginning of the 21st century, Ireland had one of the lowest unemployment levels but the country ended with the highest unemployment level (13%) in 2011. In Germany, the unemployment rate dropped from 2004 and onwards, with a slowdown from 2008 to 2011. In France and in other EU countries, in general the unemployment rate increased since 2008. The Netherlands, Switzerland and Luxembourg have the lowest unemployment rate.

At the regional level, low unemployment rates are observed in 'the blue banana' area, with the exception of Brussels (15%). Regions which are confronted with high unemployment rates are the Irish regions and to a lesser extent the regions in northern France. In proximity to the NWE-area, high unemployment rates are found in the former GDR.

In general, high unemployment levels are found in Spain, Portugal and Italy. For this reason the highest classification (17-28%) does not appear on the NWE-map.

[85] NWE-countries with high employment rates are the Netherlands, Germany and the UK (between 70% en 80%

Map 3.21 Unemployment rate

Long-term unemployment in NWE is mostly a continental and country-specific phenomenon as high shares among unemployed persons are observed in Germany (40-50% in north-west Germany, 30-40% in the South-West), Belgium (Walloon region 40-50%) and France (mostly 30-40%) but only exceptionally in the UK (Northern Ireland, north-west of England).

All NWE countries focus on reducing **youth unemployment** with various measures that facilitate the transition between school and career, pre-employment training, traineeships programmes, career assistance. These measures are foreseen either in the educational phase and /or for people searching employment and seem to be relatively successful in most parts of the co-operation area. This is also suggested by the youth unemployment rates in NWE (2009), which were generally below the EU27 average in all German regions, the Netherlands, Switzerland, Luxembourg and in parts of Belgium (Flanders) and France (centre-west of France) as well as in larger parts of England. In all other NWE regions, however, the rates were above the EU27 average (20 – 30%) and only in the region Nord Pas-de-Calais and the Walloon province of Hainaut much higher than 30%.

Labour Mobility

Labour mobility in NWE is generally favoured by the already long standing integration of the labour markets between the countries belonging to the former EEC6 (i.e. DE, FR, BE, NL, LU in 1958) and to the former EEC9 (EEC6 & UK, IR in 1973), but more recently also due to the accomplished labour market integration of these EU-Member States with Switzerland (in 2002). Measuring geographic mobility and especially labour mobility in the EU is very difficult in practice, but some overall features can be derived from EU-wide analyses on geographic mobility[86]: Across the EU, the working population is largely immobile in a cross-country perspective and there is also no indication that this overall situation has significantly changed since the past enlargements. If compared to this overall picture, however, it appears that the population of the NWE countries is comparatively more often moving within the EU and also outside the EU than the population of most other EU Member States. The share of the population originating from individual NWE countries which moved at least once in the lifetime within the EU is in nearby all cases higher than the observed EU25 average (exception: FR)[87] and a relatively similar situation appears if one looks at the moves that were realised in a lifetime outside the EU, although here more of the country rates are closer or slightly below the EU25

[86] European Commission, DG Employment, Social Affairs and Equal Opportunities (2008): Geographic mobility in the European Union: Optimising its economic and social benefits. Final Report. Deutsches Institut für Wirtschaftsforschung (2009): Labor Mobility and the Integration of European Labour Markets. Discussion Paper no. 862. Berlin.

[87] The EU25 average rate for lifetime mobility within the EU is 3.8%, whereas the rates for the individual NWE countries are the following: IE (14.5%), LU (13.2%), UK (6.6%), DE (4.9%), NL (4.4%), BE (4.5%) and FR (2.6%).

average (LU, NL, BE).[88] Bearing in mind that this general geographic mobility also shows a strong positive correlation with the frequency of job changes, then it can be concluded that NWE shows a quite satisfactory situation in terms of labour mobility which can and should, of course, be further improved. Another specific feature which can further support this positive conclusion is that NWE totals the major part of all **cross-border commuting flows** observed in the EU27, with commuting generally taking place on a daily basis[89] due to the well-developed transport infrastructure in NWE (**see Annex 3.4**).

Various EU-wide studies identified a number of general **hurdles for both general labour mobility and cross-border commuting** which are also present in the context of NWE: The most important ones are indeed language and cultural barriers, because moving away from one's home country always requires a capacity of acculturation and a process of re-socialisation which also involves changes in attitudes, values and identification. Stimulating more labour mobility in NWE can therefore focus on a further promotion of language capacity[90] and also on a stronger promotion of education abroad within the transnational area. Other hurdles for labour mobility are personal worries about finding a suitable job, which points toward the necessity of supporting information and transparency of international job opportunities in order to establish a favourable environment for mobility. Finally, but not less important, are also the obstacles resulting out of the still existing legal differences among NWE countries (i.e. different tax systems, acceptance of qualifications, different rights in terms of social insurance or pensions etc.) which can, however, not be easily dealt with due to their "rootedness" in the respective national legislations.

Due to the current attractiveness and dynamism of the NWE economy, mitigation of a foreseeable shortage of workforce can also come from a **stronger immigration to NWE either from EU countries not belonging to NWE and also from non-EU countries.** In the light of demographic change and the already noticeable shortage of qualified workforce in several parts of NWE, especially a more pro-active attraction of skilled and highly qualified labour force ("brain-gain") is certainly a strategic policy option if the NWE-economy expects to remain competitive in a long-term perspective. Acting in this direction, however, should not only consider the potential positive economic externalities associated to immigration[91] but also potentially emerging negative externalities.[92]

Education

NWE hosts a generally well-developed pre-primary, primary and secondary educational system which allows persons to access education mostly on a cost-free basis. Also the tertiary education system is well developed, as NWE hosts many of the 171 top European research universities and displays in general a high level of accessibility to universities.[93] This puts NWE in principle into a good position for contributing to the smart growth objective of the Europe 2020 Strategy and also to reach the related education headline targets.[94] However, one can observe that the total public expenditure for tertiary education is generally higher in the Benelux countries and Ireland than in the rest of the NWE regions (except Ile-de-France and Greater London).

---

[88] The EU25 average rate for lifetime mobility outside the EU is 2.7%, whereas the rates for the individual NWE countries are the following: UK (5.7%), IE (4.8%), DE (3.7%), FR (3.3%), LU (2.8%), NL (2.7%) and BE (2.5%).

[89] i.e. longer-term commuting or weekly commuting prevails within EU12 countries and/or in border regions characterised either by a deficit of public transport infrastructure or by natural, topographic barriers.

[90] The effect is direct as well as indirect. Directly, it reduces the language barrier, which is negatively associated with cross-border mobility propensities. Indirectly, it appears to reduce the cultural barriers preventing migration.

[91] e.g. reduction of labour market imbalances in NWE through a more abundant availability of qualified workers in NWE, improved skill matches in regions, higher level of innovation and entrepreneurship, lower "intra-NWE brain drain", population growth effects etc

[92] e.g. migrant workers– if not well integrated or absorbed by the labour market - could become a burden to the welfare state; sending countries may experience massive "brain drain" which hampers their long-term growth especially in case of a permanent out-migration of highly productive and well educated persons etc

[93] Only in some regions of France (Bourgogne, Centre, Basse-Normandie) and several regions in the UK (Cornwall, Cumbria, Highlands, South-Western Scotland), the population is living much more than 60 min away from the nearest university.

[94] i.e. the share of early leavers from education should be less than 10%; the share of 30–34 year olds with tertiary education should be at least 40%.

The generally favourable overall context in NWE is reflected, for the most basic level of education, by a nearby full inclusion of smaller children (aged 4) into different forms of pre-primary education[95] and, for the following educational levels, by the still relatively good situation as regards an early leave from education and training and the generally high shares of the regional population which have successfully completed tertiary education.

- As regards the proportion of **early leavers from education and training** (i.e. persons who have finished no more than a lower-secondary education, and who are not involved in further education and training), it appears that within NWE only the UK stands out with a high number of regions having shares above the EU27 average (i.e. Wales, Northern Ireland, most of England). In the rest of NWE, the shares are either below or close to the average (10-15%) or even significantly below the average (< 10% in Bretagne, Pays-de-la-Loire, Flanders, Luxembourg, Baden-Württemberg, Switzerland), which means that the latter have already met the objective set in the EU 2020 strategy.
- A large number of NWE regions have shares in their **population having completed tertiary education** that are clearly or even significantly above the EU27 average (Ireland, most of the UK, Benelux countries, Switzerland, South-west Germany, Ile-de-France) and many others in the UK, France or Germany have shares that are close or slightly above the EU27 average. This is clearly a strategic asset for NWE, as below-EU27 average shares are very seldom (i.e. 2 regions in France and several regions in Germany).
- Another positive aspect proving the attractiveness of the higher education system in NWE is the fact that especially the UK, Germany, France and Belgium stand out to be important nodes in the **Europe-wide mobility pattern of students in tertiary education.**

With respect to the current participation in upper secondary and post-secondary non-tertiary education as well as in tertiary education, however, the overall picture for NWE becomes slightly more nuanced: larger parts of the cooperation area show for both aspects mostly an around EU27 average performance and only a few areas stand out with a clear above EU27 average performance.

- At the age of 16, young people are faced with the choice of whether to remain in education, to go into vocational training or to seek employment. Over the last decade, young people have become more likely to choose to continue their education at this age in the EU27. In NWE, however, the percentage of **students at upper secondary and post-secondary non-tertiary education[96]** among the population aged 20 to 24 years is generally below or slightly above the EU27 average in most of the continental NWE regions (except Belgium with a very high level, Saarland and some Dutch provinces with higher levels) and Ireland, whereas in nearby the whole of the UK these levels are significantly higher.
- The percentage of **students in tertiary education[97]** among the population aged 20 to 24 years old gives an indication of the concentration or spread of tertiary education institutions across the regions. In most parts of NWE the shares are clearly below the EU27 average, whereas higher or very high shares are only observed in the Netherlands and Belgium as well as in a few other regions in Ireland, the UK, Germany and France. This means that the latter regions usually host bigger universities or other tertiary education institutions which, as a consequence, generally attract tertiary students.

[95] Almost all four-year-olds children attend pre-primary schools in Belgium, France, Germany, Luxembourg and in the Netherlands, whereas Ireland and the United Kingdom are the only NWE countries where a significant proportion of four-year-olds are in primary education. Eurostat (2011): Eurostat regional yearbook 2011.

[96] General upper-secondary education provides extensive all-round learning based on the basic education received. The objective is to equip students with sufficient skills and knowledge for them to go on studying. Upper-secondary education usually begins at the end of full-time compulsory education and typically requires nine years or more of fulltime education (since the beginning of primary level) for admission. Students generally start upper-secondary education at the age of 15 to 17 and finish it two to four years later. The starting/finishing ages and the age range depend on the national educational programmes. Eurostat (2011): Eurostat regional yearbook 2011.

[97] 'Tertiary education' is the level of education offered by universities, vocational universities, institutes of technology and other institutions that award academic degrees or professional certificates. Access to tertiary-level education typically requires successful completion of an upper-secondary and/or post-secondary non-tertiary level programme. Eurostat (2011): Eurostat regional yearbook 2011.

Skills development & lifelong learning

Policy on education and training (skills development) is intimately linked not only with enterprise and innovation but also with employment and social inclusion policies, since it is regarded as a central means of achieving the objectives of the latter two. Its overriding aim is to encourage lifelong learning in the EU-Member States.[98] NWE hosts a generally well-developed educational system which allows persons to access the more basic education levels mostly on a cost-free basis (primary, secondary), although it seems that in several NWE countries the professional education and vocational training systems require further improvements.

Some of this might also have influenced upon the following territorial patterns which are observable in NWE with respect to education and skills development (**see Annex 3.5**): After the end of compulsory education, young people (usually at an age between 15 or 16)[99] are faced with the choice of whether to remain in education, to go into vocational training or to seek employment. Over the last decade, young people in the EU have become more likely to choose to continue their education at this age. This trend can also be observed in the case of NWE if one looks at **the percentage of students aged 17 who continue** – for whatever reason - **their education (at all levels of education).** In the largest part of NWE the regional shares of this student age-segment are above the EU27 average of 88% or with 80-87.5% relatively close to this average (i.e. Scotland, Border-Midland-Western Ireland, Picardie, Baden-Württemberg, Rhineland Palatinate, Luxembourg). Only in England and Wales, one can observe levels that are clearly below the EU27 average. If one now turns to the adult population aged 25 to 64, one can see that the disposition of this population segment to **participate in lifelong learning measures** is highly variable in NWE. An Eurostat survey of 2008 shows that high levels of the adult population participating in education and training are only observed in Switzerland (> 25%) as well as in the UK and the Netherlands (15 - <25), whereas in the rest of the NWE the levels are significantly lower (5 - <10 or even <5 in parts of the Walloon region).

Despite the importance and evident territorial dimension of those issues, co-operation might be difficult to initiate on those matters because some NWE countries retain full competence in this broad area at only the national levels whereas in some other countries regional or local level responsibilities do exist.

Poverty & social exclusion

A look at the regional net adjusted disposable household income across NWE suggests that the benefits or transfers in kind provided by the existing domestic social protection and social assistance systems still largely fulfil their social integration function. Although NWE does not include regions which have a significant **level of human poverty** in an EU-wide perspective, **some marked territorial disparities do exist:** if one considers the United Nations Human Poverty Index, then it appears that on the continental part of NWE the poverty levels are higher in France, southern Belgium and Luxembourg and lower in Germany, the Netherlands and northern Belgium, whereas in the UK and Ireland they are somewhat higher in Wales, Northern Ireland and in the north-west of Ireland if compared to the rest of both countries. This pattern changes if a look is taken at **the population at risk of poverty after social transfers**, because now the risk is lowest in the Netherlands and Flanders and comparatively higher on the other continental parts of NWE, whereas they are overall higher in larger parts of the UK and also relatively pronounced in the north-west of Ireland.

Health[100]

Diseases of the circulatory system include cerebrovascular diseases, schaemic heart diseases and other heart diseases; these pathologies accounted for 39.7 % of deaths in the EU-27 in 2008.

---

[98] European Commission, DG REGIO (2010): 5th Report on economic, social and territorial cohesion.

[99] i.e. The age when compulsory education ends vary greatly between the EU Member States. In most countries, compulsory education ends at the age of 15 or 16, which is typically at the end of lower secondary education. By the age of 17, it is possible to have finished secondary education in some countries, whereas in others, pupils may have just started the upper-secondary level (often high school or vocational training leading directly to a labour market qualification).

[100] Bureau Buiten, Analysis of Data & Policy Context NWE

The French, Dutch and Southern UK regions have relatively low death rates from diseases of the circulatory system. Other regions in NWE have higher death rates.

There are many different types of cancer (malignant neoplasms) including those of the larynx, trachea, bronchus, lung, colon, breast or prostate, as well as lymphoid or haematopoietic cancers. Malignant neoplasms were the second most common cause of death in 2008, accounting for 25.7 % of deaths in the EU-27.

Countries with low death rates from cancer are Germany, France and the South of the UK. Compared to other NWE countries the Netherlands, Scotland, Ireland and the north of France have relatively high death rates.

High rates of people with respiratory diseases are found in parts of Belgium, the UK and Ireland. Respiratory diseases include infectious acute respiratory diseases (such as influenza and pneumonia) and chronic lower respiratory diseases (such as asthma). They were the third most frequent cause of death in the EU-27 in 2008, accounting for 7.9 % of all deaths.

Among other factors, many respiratory diseases show a connecting with air pollution (e.g. from road traffic), which makes this topic transnationally relevant.

The topic is also of economic importance; health care is an important sector in terms of employment and innovation. Also the percentage of GDP spent on health care causes pressure on economic performance.

6.1. Additional territorial considerations of Inclusive Growth in NWE

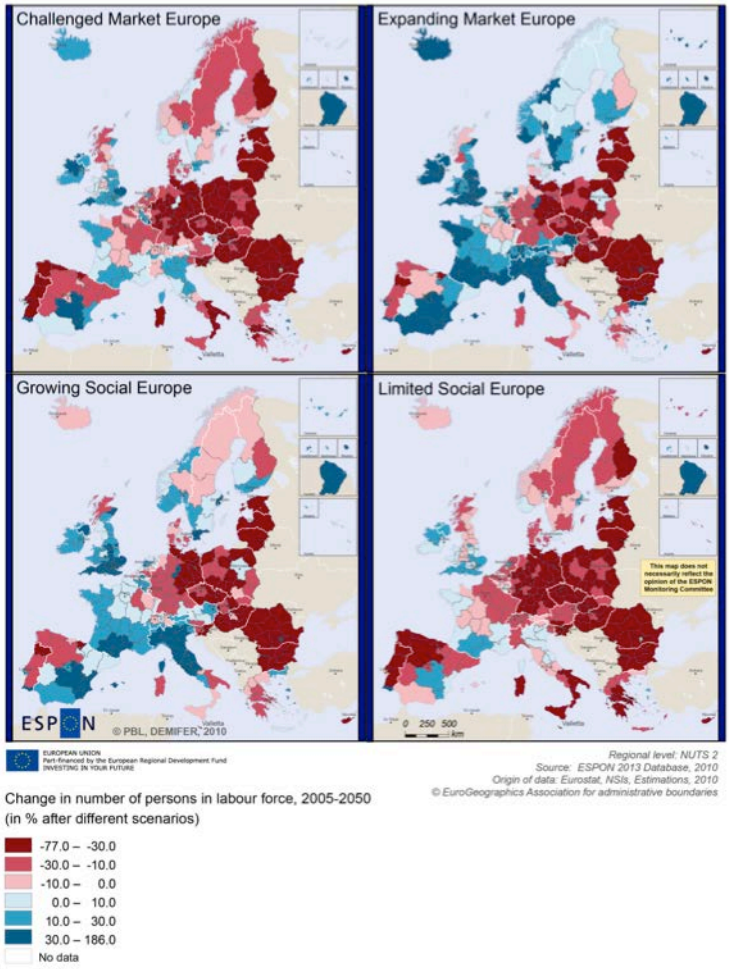
Despite the overall positive picture for the long-term unemployment rate and a similar picture as the EU27+4 for people at risk of poverty, the NWE area is characterised by significant disparities among its regions in terms of 'inclusive growth' indicators. The analysis of this set of indicators, especially those relating to employment, illustrate the existence of an east-west gradient within the NWE area. For example, the employment rate in 2010 shows high internal disparities within the area which do not necessarily keep up with national borders. Eastern NWE regions are generally above EU27+4 averages, while those in the west are below or around EU27+4 average. This is also the case for youth unemployment where eastern regions include the lowest rates (<10% - including the Netherlands, some German regions) and western regions include the highest rates (> 30% - incl. Nord Pas de Calais, Western Scotland).

The ESPON DEMIFER project deals with the effects of demographic and migratory flows on European regions and cities and examines the implications for regional competitiveness and European cohesion. According to the project, without changes in the levels of fertility, mortality and migration, 60% of European regions will experience population decline by 2050. In addition, if labour force participation rates do not change, the size of the labour force will decline in 75% of the regions until 2050. However specific policies relating directly to health, family and migration incentives and barriers, as well as social and welfare policies will have significant impacts on the behaviour feeding into these trends.

All four DEMIFER scenarios predict the highest negative values for potential labour force change in the east of NWE, while the north-west could experience positive percentages of persons in labour force in the next decades. Some regions performs regardless of the scenario: South eastern England, Ireland, Brittany-Pays de la Loire are foreseen a positive labour force growth; North western Scotland, German regions should face labour force decrease[101].

[101] http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/DEMIFER/demifer_PB_lf_scenario.pdf

Labour force changes under the four DEMIFER scenarios



Finally, it is important to take into consideration that **poverty and social exclusion have in NWE a strong territory-specific dimension** which can not be revealed by looking at personal characteristics such as education, employment status, household type and age, because it strongly depends on where a person lives.[102] Especially in NWE, the "urban paradox"[103] is a marked feature of this territorial dimension: this means in general that the proportion of people living in a jobless household or facing severe material deprivation and a risk of poverty or exclusion is in most of the well developed countries belonging to NWE more present in larger urban areas rather than in rural areas, towns and suburbs. If compared to the EU average, however, the scope of these individual aspects is quite variable. Consequently, it is also not astonishing to see that poverty is perceived to be high in most of the NWE cities which were included in the Urban Audit.

[102] Estimates of regional poverty based on education, employment status, household type and age considerably underestimate the territorial variation of poverty. In other words, the at-risk-of-poverty rate depends not only on a person's education or employment status, but also on where they live ('location effect').

[103] This paradox expresses in essence that inclusive growth is inversely related to the level of economic development: the more developed Member States tend to have less inclusive cities.

Topics relating to the "Inclusive Growth Objective" of Europe 2020 (i.e. actions on employment, skills & fighting poverty)				
	STRENGTHS	**WEAKNESSES**	**OPPORTUNITIES**	**THREATS**
Promoting employment and supporting labour mobility	• High regional employment rates in major parts of NWE & medium-high employment rates esp. in France and Ireland (2010). Relatively little changes of regional employment rates on the continental part of NWE during the immediate crisis period (2008-2010). • Existence of specific policy measures in all NWE countries addressing specific target groups being excluded from the labour market or having difficulties in terms of job integration. • Well developed transport infrastructure, helping especially people in rural or more remote areas and border areas to access job opportunities. • Long-standing labour market integration in NWE, favouring comparatively high levels of cross-country labour mobility and bringing NWE also at a first place in the EU with respect to cross-border commuting intensity (volume of commuter flows).	• Some geographical "hot-spots" with low regional employment rates esp. in northern France & southern Belgium (2010). Strong changes of regional employment rates esp. in Ireland and the UK during the immediate crisis period (2008-2010). • Existence of specific social target groups being excluded from the labour market or having difficulties in terms of job integration (e.g. long-term unemployed, less qualified young persons, elderly, women wanting to return into jobs, disabled etc) • Demographic change leads already now to a beginning shortage of a skilled & highly qualified labour force in several NWE countries and regions. • High CO2 impact of individual car use to reach workplaces (domestic & cross-border workplace commuting) • Various hurdles hampering a more widespread transnational and cross-border labour mobility in NWE (i.e. lack of widespread foreign language proficiency, cultural-mental barriers, lack of information, different legal provisions on social & fiscal matters or with respect to a recognition of diploma etc). • Employment policy is considered a more nationally dominated policy area	• Gaining new workforce potentials through focussed action on certain person groups: Better integration into work of specific target groups which are currently not yet active in several countries or regions of NWE (women & elderly). Targeted action towards a reduction of youth unemployment, especially in the regions being most affected.. • Attractiveness and dynamism of the NWE economy as a good asset for attracting skilled & qualified labour force ("brain-gain") from "outside". • Some effects of demographic change can be used as a source for developing new employments. This is particularly relevant for an aging population the development of targeted services for the elderly (e.g. the "silver economy"). • More use of ITC to stimulate distance work facilities especially in rural and remote areas. • Potentials for further increasing the transnational and cross-border labour mobility in NWE. Potential to compensate a shortage of labour force through new/additional inward migration from non NWE-areas • Specific opportunities for the development of a transnational approach include: entrepreneurship education, pre-employment training, removing barriers for a transnational labour market.	• Risk of social dumping and increase of the "working poor" phenomenon (i.e. the salary from one job is not sufficient any more for earning one's living). • Continuation or even further increase of the share of the active population being excluded from the labour market. • Decreasing availability of qualified workforce in NWE (i.e. growing shortage of skilled labour force & especially of highly qualified labour force) and increasing pressure on the NWE economy (insufficient supply of skilled & highly educated personnel). • Unfavourable cost-benefit relation hindering a further roll-out of ICT infrastructures and services especially in rural and remote areas. • Hurdles for both general transnational labour mobility and cross-border commuting persist and hamper the development in NWE.

Investing in education, skills & lifelong learning	• Generally well-developed educational system, allowing persons to access education mostly on a cost-free basis (primary & secondary education). • In the largest part of NWE, the regional shares of students aged 17 years continue education (above the EU27 average of 88% or with 80-87.5% relatively close to this average). • Generally well-developed disposition of the population to engage in lifelong learning in CH, NL and UK. • Well-developed educational system which allows persons to access education mostly on a cost-free basis (pre-primary, primary, secondary, tertiary education). Also existence of many world class universities. Historically high levels of investment in higher education. • Very high level of participation in pre-primary education (nearby full inclusion of smaller children aged 4) and also generally high shares of the NWE population which have successfully completed tertiary education. Also fairly good situation as regards an early leave from education and training. • Long-standing free movement of persons in NWE stimulating mobility of students.	• In several NWE countries the professional education and training systems already require further improvement. • In England and Wales, the level of students aged 17 years continuing education is clearly below the EU27 average. • Less well-developed disposition of the population to engage in lifelong learning in IE, FR, LU, DE and BE. • Certain regions and cities with big universities or other tertiary education facilities attract talent (monocentric development): NWE-internal "brain drain" to stronger regions. • The current participation in upper secondary and post-secondary non-tertiary education as well as in tertiary education is in larger parts of NWE mostly at an around EU27 average performance. Only a few areas stand out with a clear above EU27 average performance.	• Potential for adapting educational system to the requirements of a knowledge society & knowledge economy. • Good potentials in most of NWE to meet the skills requirements of a knowledge society & knowledge economy. • Potential for further increasing lifelong learning in IE, FR, LU, DE and BE. • Further inter-linkage and networking among existing (world class) universities to foster the basis for generating the "grey potential" that is necessary for a knowledge-based society and economy in NWE. • Further stimulating participation in upper secondary and post-secondary non-tertiary education, especially in NWE areas currently underperforming. • Potentials for further increasing the mobility of students within NWE. • Transnational cooperation would allow the opportunity to overcome competition over skilled labour, and instead develop joint strategies to support labour mobility of skilled workers into the NWE area or between NWE regions to balance shortages.	• Lack of public funds for adapting educational system to the requirements of a knowledge society & economy, due to growing public indebtedness. • Growing non-involvement in lifelong learning. • There are considerable differences in levels of education across NWE, which may further the risk of social inequalities and exclusion • Reduced investment in higher education due to public funding limits. Demographic changes might place pressure on higher education systems. Increasing "brain-drain" away from NWE, benefiting other parts in Europe and especially other Third Countries (e.g. USA). • Reduction of participation in upper secondary and post-secondary non-tertiary education (& further geographical polarisation) and increase of early leave from education and training, representing a risk for developing a knowledge-based society and economy in NWE. • Increasing NWE-internal "brain-drain". • In an ageing and shrinking NWE, economic growth will depend more and more on the availability of skilled labour and countries or regions may start competing against each other to obtain it.
Promoting social inclusion and combating poverty	• Existing systems of social protection & social assistance still fulfilling their social integration function. • Dense network of non-governmental and voluntary organisations ensuring a complementary integration function. • Attractiveness of NWE for immigration from non-EU countries	• Poverty is present in NWE, albeit at different levels within the countries and across regions. • In most NWE countries, poverty and social exclusion is highly visible in the larger urban areas (and here often concentrated in problematic neighbourhoods), but less pronounce or probably more hidden in the rural areas town and suburbs. • Partly successful integration of the population from non-EU countries into	• Greater awareness about urban and rural poverty and exclusion phenomena and better tackling of the respective problems • Mobilisation of new workforce potentials through a better integration of the population from non-EU countries • Health care is an important sector in terms of employment and innovation	• Significant cutbacks in social protection and social assistance systems in NWE (financial & scope of services), due to the effects of growing public indebtedness. • Further increase of the "living poor" phenomenon, leading to social exclusion already before the working age is reached (children) and also after a retirement from work has taken place (elderly persons).

		work and/or the wider society. • Social policy is considered a more nationally dominated policy area.		• Risk of increasing violence and other unwanted extreme phenomena in the society (e.g. criminality, youth gangs, "no-go areas", xenophobia & racism etc) • Fragile and at-risk populations are more vulnerable to health problems, especially those generated in urban environments

6.2. Conclusions for the Inclusive Growth Objective

What are the main lessons from the current Interreg IVB NWE programme?

The following paragraphs provide a picture of some of the IVB programme's main outputs until 2012. Even though these figures provide a preliminary indication with regard to the types of projects being funded, it is important to keep in mind that they illustrate the stock of projects at a given point in time, rather than the flow throughout the programme's lifetime.

The 'inclusive growth' dimension of the current programme is weak as illustrated by the low number of projects covered by this objective (15). The 9b investment priority (support for physical and economic regeneration of deprived urban and rural communities) covers the highest number of projects under the objective.

Where could transnational cooperation be of added value and under what conditions?

Territorial evidence points to the fact that there are increasing differences among and within NWE regions and cities with regards to a number of inclusive growth indicators (e.g. employment and labour force, poverty and social exclusion). There are also considerable differences in levels of education across NWE, which may further the risk of social inequalities and exclusion. Austerity measures taken on behalf of Member States and local authorities are likely to bring about significant cutbacks in social protection and social assistance systems in NWE (financial & scope of services), due to the effects of growing public indebtedness. This will certainly have an impact on the overall wellbeing of societies and may generate further inequalities within them.

The previous section illustrates some of the issues the NWE needs to address in order to promote inclusive growth, as well as to avoid the deepening of existing social gaps in the future. Among these issues, there is the need to:

- Reduce unemployment (youth, long-term, elderly)
- Address the issue of shrinking population and workforce
- Facilitate labour force mobility and integrated labour markets
- Attract/maintain highly skilled work force
- Strengthening lifelong learning
- Fighting poverty and social exclusion in urban areas
- Addressing health issues related to air and water pollution (particularly within fragile social groups – e.g. respiratory diseases)

However, it is rather difficult to address many of these issues from a transnational policy perspective. Most of these are generally best dealt with at the Member State or local level. Others, such as labour market integration, as best adapted for cross-border cooperation programmes. As a result, the added value of direct intervention within the framework of transnational cooperation in this field is, in principle, low. As such it is suggested the future programme does not focus on any of the Thematic Objectives associated to the Inclusive Growth (8,9,10). This argument is further supported by the relative positive position of the NWE area in light of inclusive growth indicators in comparison to other regions of Europe.

As a result, the promotion of inclusive growth should be embedded through the programme as one of its cross-cutting dimensions. European Territorial Cooperation is in the end, an objective of the European Cohesion policy.

The 'inclusive' dimension could be injected into the Thematic Objectives under smart and sustainable growth as follows:

- Thematic Objective 1: By reinforcing the 'social dimension of innovation' and support the development of technologies with a high social impact e.g. in e-health.
- Thematic Objective 3: By specifically targeting the development and creation of social enterprises.
- Thematic Objective 4: By focusing specifically on energy in rural territories. Rural communities very often have a carbon footprint that is greater than their needs and higher energy consumption than their urban counterparts, and are often forced to choose highly polluting energy sources such as coal, domestic fuel or wood because the other sources are not yet fully exploited. The TO could also focus on addressing territorial 'energy poverty' or supporting energy efficiency and renewable energy use in public and social housing. This thematic objective could also focus on building labour force skills in the use and installation of new energy technologies.
- Thematic Objective 6: By supporting actions to improve the urban environment in low-income urban neighbourhoods.

In addition to integrating the 'inclusive' dimension to the future programme through the types of actions to be supported, the selection criteria of the programme should also be developed on the basis of these challenges. As a result, it is recommended that the future programme develop selection criteria geared towards addressing issues such as reducing social gaps and poverty, improving labour markets and labour forces, fighting social exclusion and improving higher and lifelong education.