



## Selection of Regions for Case Study Research on Regional Policies for Transformative Use of ICTs

### Introduction

This brief outlines the process through which the TRANSFORM research team selected a set of case study regions for detailed investigation. The case studies are intended to enhance our understanding of the relationship between Regional Innovation Culture (RIC) and the uptake and transformative use of ICTs and to help us consider what kinds of policies might be effective in different types of region. The final decision on case study regions will be taken after consultation with the European Commission and the TRANSFORM groups of external experts.

The project budget limits us to undertaking only 16 regional case studies. The question of what constitutes a 'region', of course, remains much debated. For the purposes of case study selection we use NUTS 2 as a starting point. There are a number of reasons for this, not least of all our intention to maintain compatibility with the key databases used for regional policy-making at EU level. Moreover, the availability of comparative regional data is a core requirement, including data on the uptake of ICTs which forms one criterion against which we select our case studies. The case studies will, of course, take the local context (administrative arrangements, travel-to-work patterns, etc.) into account when settling on the geographical scope of the actual fieldwork within these NUTS 2 regions.

Although it is clear that the limited number of case studies in TRANSFORM cannot be representative of the 280 NUTS 2 regions in Europe from any meaningful statistical perspective, our intention in selecting our case studies is to achieve a broad geographical coverage – encompassing old and new Member States and countries in the geographical north, south and centre of the European space. It is also our intention to cover a range of regions in terms of industrial structure, peripherality and levels of innovation rather than merely the most advanced regions and/or the 'usual suspects'.

In order to reflect differences between regions located within the same national space, and thus to control to some degree for national factors, we attempt to cover two contrasting regions in each of the selected countries. We have followed this route for seven of the nine chosen countries. We

have adopted a different approach in two other countries, Estonia and Ireland for reasons to be explained below.

### Approach to Case Study Selection

At an early stage in the project, we set out three preliminary criteria for selecting case study regions:

- **Location in European Space** – producing a three-fold classification, into '(Old) North'; '(Old) South' and 'New Member State'. The justification for this distinction comes from ESPON, the Commission's Third Cohesion Report, and a range of other European studies quoted below.
- Relationship between **ICT adoption** (using an ESPON ICT adoption composite measure) and **GDP per capita**. This was expected to classify regions into two categories according to whether their ICT adoption was **higher** than expected given their level of GDP per capita ('ICT-intensive') or **lower** than expected ('ICT-under-intensive').
- Relationship between **ICT adoption** and **GDP growth**. This was expected to classify regions into two categories according to whether their GDP was **higher** than that 'predicted' by their level of ICT adoption ('Transformative users') or **lower** ('Under-achievers').

It was understood that this exercise would be exploratory and indicative. In the event, although these criteria remained central to the process of selection, they were supplemented by other factors.

A number of approaches were adopted to case study selection:

- A **statistical exploration of available data** on the uptake and use of various forms of ICTs, drawn from a project carried out within the ESPON Programme, to create a four fold typology;
- Other, **already established typologies** which classify NUTS 2 regions were explored to further ensure that we had coverage of a variety of regions (see Tables 3 and 4);
- A review of **various documentary sources** was undertaken to ensure (a) that we had

contrasting regions within each country we selected and (b) that that there was actually some degree of activity (and therefore something to study) in the regions selected<sup>1</sup>;

- An analysis of the project consortium's resources to ensure that language and other capacities were available for the successful completion of case studies;
- Discussions on the relevant regions took place with the TRANSFORM Regional Innovation Culture Expert Group (RICEG) at a workshop conducted in summer 2006<sup>2</sup>, supplemented with discussions with members of the TRANSFORM Indicator Development Expert Group (INDEG) and other regional policymakers, through the consortium's networks. From this process it became clear that there were potential 'warm hosts' – regions where access could be facilitated. This was seen as an important resource for the consortium. However, we needed to balance this against our determination to not only include the 'usual suspects' in terms of regional case studies.

## Selection of Countries

The starting point for selection of case study regions was that we would seek to achieve broad geographical coverage of the European Space, covering both old Member States (OMS) and New Member States (NMS) and reflecting north-south, east-west and core-periphery differences.

**Table 1: Selected Member States**

Country	Place in European Space
Estonia	New Member State
Germany	Old North
Ireland	Old North
Italy	Old South
Poland	New Member State
Slovakia	New Member State
Spain	Old South
Sweden	Old North
U.K.	Old North

It was felt important to have a **Nordic country** included in the study. All evidence points to the 'Nordic bloc' countries being the most advanced in Europe in terms of uptake and use of information and communications technologies, as well as on wider indicators on the knowledge-based economy and society. **Sweden** was chosen as

being the most advanced Member State on a range of indicators. As well as being one of the three European 'tigers' in terms of ICT production, Sweden has high levels of uptake and use of the most advanced technologies in terms of both the consumer/citizens and businesses.

It was also felt important to include at least one of the three **Baltic NMS**. In deciding on whether to include one of these States, however, we had to consider whether comparisons could be made with other regions under consideration. For example, these states are categorised as NUTS 2 at national level, whereas the other regions we consider are NUTS 2 at the sub-national level; being 'country-regions' these States have more policy levers than the typical European NUTS 2 region; the dominance of the respective national capitals in very small countries, both in general terms and in terms of ICT related activities, means that it will be difficult to explore sub-national RIC. A counter argument was put that (a) the constraints of working within the framework of EU policy and (b) the size of these countries meant that they faced similar constraints and opportunities to those faced by many NUTS 2 regions. These latter arguments won the day. All three NMS Baltic country-regions are regarded as 'potential' regions in our own, ESPON-derived typology (see below) so we needed to look more widely in terms of deciding which country to select as a case study. After consideration, **Estonia** was selected. Estonia is widely regarded as being a leading New Member State in terms of information society developments on a range of indicators of ICT production, ICT uptake and use by both consumers and citizens, and by enterprises. Indeed, the country outperforms several regions in the OMS countries and has a high networked readiness index.

**North-west Europe** is represented by the **UK** and by **Ireland**. Beyond the obvious practical reasons for its inclusion, it was felt sensible to consider the UK as perhaps the most neo-liberal of the EU15, and the earliest to liberalise its telecoms market. Also as one of the most centralised states in Europe, with a weak regional infrastructure, the UK forms an interesting contrast with several other Member States, notably Germany and Spain, which have federal and strongly regionalised structures. Ireland, which similarly has traditionally been a strongly centralised state, is included as an economic success story in the OMS: What lessons can Europe learn from the experience of the 'Celtic Tiger'?

**North-central Europe** is represented by **Germany**, the EU's largest country. As mentioned above Germany provides a contrast with UK in terms of degrees of subsidiarity of regional policy. Germany is also interesting in that allows us to

<sup>1</sup> A number of European studies were consulted as well as appropriate country websites. For example: BEEP: [www.beepknowledgesystem.org](http://www.beepknowledgesystem.org); BISER: [www.biser-eu.com](http://www.biser-eu.com); IANIS <http://www.ianis.net/>; Understand: <http://www.understand-eu.net/>; CEC (2002) 'RIS under ERDF', Brussels: European Commission, DG Regional Policy; Websites of: ERDF Regional Programmes of Innovative Actions 2000-2006; LEADER; THEMIS.

<sup>2</sup> First RICEG workshop, Ronneby, Sweden, June 16, 2006.

explore both an ‘old member region’ and ‘new member region’ within a single nation state.

**Southern Europe** is represented by **Italy** and by **Spain**. The former is, of course, characterised by a marked north-south divide and this will form a context within which to explore the key issues of the project. Spain is included as the ‘cohesion’ country which exhibits the widest range of types within the ESPON-derived classification; all four categories are represented within Spain, whereas the Portuguese and Greek regions are overwhelmingly classified as ‘laggards’. Both Italy and Spain have a number of informational advantages in that both have well developed regional information society observatories and regions from both have been involved in a number of European IS initiatives.

**Poland** is included as by far the largest of the NMS, with a population of over 38.5 million, and because of its wide regional variation. All Polish regions except the Warsaw region fall into the category of lagging regions in our ICT typology. Because of its size Poland faces different problems from the other two NMS, particularly around infrastructure coverage. **Slovakia** is chosen as one of the smaller new Member States. As with Poland, our analysis suggests that all Slovakian regions are lagging. On the other hand more recent data suggest that Slovakia is one of the faster adopters of ICTs in the NMS and we would anticipate that at least some regions, notably Bratislavsky Kraj, will move out of the laggard classification sooner rather than later.

## Selection of Regions

After selection of the countries in which case studies will be carried out, the second step was to select regions within those countries for our field research. Here we have sought to: (1) ensure a high degree of diversity of regional types across the European space; (2) ensure a high degree of variation within individual countries. The latter approach is to allow us to explore differing regional outcomes within the same national context.

The starting point for regional case study selection in order to meet the above criteria was a statistical exploration of data which emerged from a study under the first round of ESPON projects (ESPON 1.2.2)<sup>3</sup>. Our analysis explored two sets of relationships: that between ICT adoption and GDP per capita (in PPP); and that between ICT adoption and the growth rate of real GDP per capita. The detailed methodology and results are contained in deliverable 1.2. In essence, the statistical analysis allowed us to create a four-fold typology. The four types are: Vanguard (or

Leading) Regions, Potential Regions, Sluggish Regions, and Lagging Regions<sup>4</sup>.

**Table 2: Selected Regions**

Code	Region Code/ Name	Type
PL63	Pomorskie	Lagging
PL21	Malopolskie	Lagging
SK01	Bratislavsky Kraj	Lagging
SK04	Vychodne Slovensko	Lagging
EE00	All country	Potential
DEF0	Schleswig- Holstein	Sluggish
DEG0	Thuringen	Lagging
SE07	Mellersta Norrland	Leading
SE04	Sydsverige	Leading
ITC1	Piemonte	Sluggish
ITG2	Sardegna	Sluggish
ES22	Navarra	Leading
ES43	Extremadura	Lagging
UKE3	South Yorkshire	Potential
UKH1	East Anglia	Leading
IE01	Borders, Midlands & West	Potential

Of the 259 regions (out of 280 European regions) analysed the largest single group (44%) fall into the ‘lagging’ category; 23% fall into the ‘sluggish’ category, almost 13% are classed as having ‘potential’ and only just under 14% are classed as ‘vanguard’ or leading regions. As a consequence, we have selected a larger number of ‘lagging’ than other regions. This also reflects the fact that lagging regions are a core target for EU policy support.

Another constraint in selecting regions is that ‘national effect’ means that in several countries there is either only one type of region – for example Sweden has only leading regions – or have only two types – for example, Germany and Italy have only two types. We have in general not selected capital regions as they are often not representative of other regions within a country, though we have made two exceptions for reasons outlined below (see Estonia and Slovakia).

The TRANSFORM statistical analysis allowed us to make an initial selection of regions. In order to ensure that we had a variety of types of region across the European space we also utilised some other existing typologies. Table 4 locates our case study regions on the basis of a range of typologies. As the table illustrates, at the European scale, our selected regions vary considerably in terms of wealth, industrial structure, levels of skills/knowledge, degree of peripherality and levels of innovation.

Another element in the selection process was an analysis of the research literature on ICT. This process had two purposes. First, to ensure that

<sup>3</sup> See: [www.ESPON.eu](http://www.ESPON.eu).

<sup>4</sup> See: TRANSFORM Deliverable 1.2 for details of typology construction

the regions we selected were sufficiently different to make meaningful comparisons within national contexts. Second, to ensure that there was evidence that the selected regions were sufficiently engaged in the Information Society policy to suggest that there would be something worthy of study on the ground. The aim of this project is not, of course, to seek out only 'best practice' and our search therefore was not designed to find regions which are necessarily 'leading the field', nor are we attempting to pre-judge the effectiveness of what is going on in any particular region. Rather we are seeking to ensure that there are sufficiently developed policies, institutions and initiatives in place to allow us to

## Germany<sup>6</sup>

The reunification in 1990 made Germany the most populated Member State of the European Union. It is divided into 41 NUTS 2 regions, two of which double as "Bundesland". The division of responsibility between the Federal Government and the "Länder", with a strong emphasis on the principle of subsidiarity, results in a high degree of autonomy of Länder governments concerning regional policy. We have selected two Länder, Schleswig-Holstein (DEF0) in former West Germany and Thuringia (DEG0) in former East Germany, to identify the factors through which regional actors embrace new technology and to

**Table 3: Key Indicators on Regions Selected<sup>7</sup>**

	Area in km <sup>2</sup>	Population			GDP/head in PPS		Unemployment rate (%; 2005)	HRST (%; 2005)
		Total (2004)	% Annual Change	Density (2003)	EU25=100 (2003)	% Change 1999-2003		
Pomorskie	18293	2191.5	-0.08	120	46.3	-0.2	18.9	29
Malopolskie	15190	3256.6	0.17	214	40.4	0.5	15.2	31
Bratislavsky Kraj	2052	600.5	-0.68	292	115.9	13.9	5.3	55
Východné Slovensko	15733	1565.6	0.21	99	38.8	3.5	23.1	27
Estonia	43432	1349.3	-0.39	31	48.2	9.5	7.9	52
Schleswig-Holstein	15763	2826.0	0.41	179	98.3	-7.5	10.3	46
Thuringen	16172	2364.2	-0.79	147	75.2	0.1	17.2	53
Mellersta Norrmland	71028	371.7	-0.55	5	105.5	-1.5	8.2	43
Sydsverige	13982	1306.9	0.55	93	107.1	-1.0	8.5	47
Piemonte	24860	4300.2	0.27	167	122.0	-11.1	4.7	33
Sardegna	23892	1646.6	0.07	68	83.4	-2.3	12.9	28
Navarra	10421	576.8	1.18	55	123.1	9.0	5.6	53
Extremadura	41634	1067.5	0.21	26	63.8	3.6	15.8	33
South Yorkshire	1552	1278.8	0.11	816	89.4	6.7	5.3	32
East Anglia	12561	2239.9	0.42	176	106.8	6.0	4.1	39
Borders, Midlands & W	32097	1086.0	1.88	33	92.5	4.0	4.4	36

carry out meaningful regional case studies.

This process was supplemented by discussions with experts, notably our RICEG and INDEG expert groups, in workshops in Ronneby and Newcastle, but also at other networking events attended by consortium partners. These events also revealed a number of potential 'warm host' regions.

## Brief Portraits of Case Study Regions

In this section we provide a set of short portraits of our selected regions<sup>5</sup>. They demonstrate differences and similarities between regions within countries, and outline the level of initiative apparent with regard to the knowledge-based economy and society. See also Table 3.

<sup>5</sup> Sources used for the description include Eurostat's "Portrait of the Regions" website (<http://forum.europa.eu.int/irc/dsis/regportraits/info/data/en/>); EURES's "Job Mobility Portal" (<http://ec.europa.eu/eures/>) as well as other sources where mentioned. All statistical data are from Eurostat (latest available data at time of writing), except stated otherwise.

learn how regions can best tap the full potential of information and communication technologies.

## Schleswig-Holstein

Schleswig-Holstein is the northernmost of the NUTS 2 regions in Germany. It borders on Denmark in the north, the North Sea in the west, the Baltic Sea and Mecklenburg-Western Pomerania in the east, and Lower Saxony and Hamburg in the south. The former Duchy of Holstein constitutes the southern part of the

<sup>6</sup> This section draws on: Kröhnert, S. et al. (2006) 'Die Demographische Lage der Nation. Wie zukunftsfähig sind Deutschlands Regionen?' München: DTV; TNS Infratest (2006) 'Nonliner Atlas 2006. Eine Topographie des digitalen Grabens durch Deutschland', Initiative D21; Eurostat (2005) 'European Union Labour Force Survey 2004', Luxembourg: Office for Official Publications of the European Communities.

<sup>7</sup> Indicator definitions: Area in km<sup>2</sup>; Annual average population in 1000, 2004; Total population change: average for 2000 to 2003 (UK: 2001); Population density: Inhabitants per km<sup>2</sup> in 2003; GDP per inhabitant (in PPS), EU25=100, 2003; Change of GDP per inhabitant (in PPS) in percentage points of the average EU25, 2003 as compared with 1999; Unemployment rate, 2005; Human Resources in Science and Technology (HRST) in percent of labour force 2005.

Bundesland, whereas Southern Schleswig constitutes the northern part. Furthermore, the Duchy of Lauenburg and the former Free and Hanseatic City of Lübeck in the southeast of the state are part of today's Schleswig-Holstein.

In 2002 services generated more than 75% of the total gross value-added of Schleswig-Holstein. The State accounts for a higher albeit declining proportion of value-added in Schleswig-Holstein than in any of the other formerly West-German Land. The reason for this was that Schleswig-Holstein had the highest number of servicemen stationed, but numbers have been declining for many years. The technology sector is relatively weak in Schleswig-Holstein, the share of the population working in Science and Technology is slightly below the EU 25 average, while the agriculture sector still employs 3.5% of the workforce and maintains an important role in the economy. The reduction of the armed forces after reunification and the loss of jobs in manufacturing since the 1970s has hit Schleswig-Holstein very hard. Nevertheless, in 2005 the unemployment rate was slightly below the national average.



Many of the remaining jobs are in medium-high and high-tech manufacturing; Schleswig-Holstein is a European stronghold of marine technology and renewal energy technology. It is not surprising, therefore, that employees in medium-high and high-tech manufacturing make up a bigger share of the workforce than in the average EU NUTS 2 region, while persons employed in high-tech services are slightly underrepresented. About 4% of the workforce work in tourism. A number of rural areas additionally profit from retirement migrants. One of the biggest asset of Schleswig-Holstein is the proximity to Hamburg, the Land with the highest level of GDP per head in Germany (184% of the EU 25 average) and the fastest growth of GDP in the period between 1995 and 2004 (15.8%). One in seven of Schleswig-Holstein's resident workforce is employed in Hamburg. Six of the 11 administrative regions of Schleswig-Holstein belong to the metropolitan region of Hamburg. These regions experienced a population growth of at least 10% over the last 15 years.

In our own ESPON-derived typology Schleswig-Holstein is classified as a 'sluggish' region, together with most of the other NUTS 2 regions from the formerly West-German Länder. More recent research focusing on the national level suggests that the region is one of the more advanced regions in Germany. For example, the share of internet users is slightly above the German average and reached 59.9% of the population in 2006. More than half of the internet users now have access via broadband, again well above the norm. Interestingly from a TRANSFORM perspective, Schleswig-Holstein is in the leading group of the NUTS 2 regions in Germany concerning the use of the internet by elderly people, by people with low skills, and by women.

A number of ICT-related initiatives are under way in Schleswig-Holstein. For example, the Business Development and Technology Transfer Corporation of Schleswig-Holstein aims at reducing structurally induced competitive disadvantages in certain regions of Schleswig-Holstein by supporting the introduction and implementation of company-specific business-to-business ICT solutions in SMEs. Measures include subsidies for necessary hardware, consultancy, conceptual design and implementation of a B2B platform, as well as for training and qualification schemes for personnel.

### Thüringen (Thuringia)

The "Free State of Thuringia" is located in central Germany and is eleventh out of sixteen of the country's Bundesländer in terms of size and twelve in terms of population, with 2.35 million inhabitants. Thuringia borders on (from the north and clockwise) the German states of Lower Saxony, Saxony-Anhalt, Saxony, Bavaria and Hesse. The region has suffered from declining population, having lost 8.4% of its population between 1991 and 2004. This is due to both a low birth rate and outward migration, particularly of women to western Länder.

In the period 1995 to 2003, Thuringia achieved the highest annual growth rate of GDP of the five formerly East-German Länder, though it has gone through an often painful restructuring process. Services are the dominant sector, accounting for 69% of value added. Manufacturing has shrunk significantly since unification, though, together with construction, it still accounts for 29% of GVA. The region has built on a long tradition in engineering especially vehicle construction, glass manufacturing, pharmaceutical industry and microelectronics to create a reasonably diversified economic structure. Prior to unification Thuringia had supplied the whole Eastern Bloc with microelectronics, and the sector then employed nearly 60,000 people. These numbers have

drastically decreased, but manufacturing of office and data-processing still accounts for 8.2% of value added. In recent years, the region of Sömmerda developed into one of the major computer hardware centres of Europe with an annual production of 1.5 million computers and 2,000 employees in approximately 60 companies. Auto manufacture also remains a significant employer.

The level of unemployment in Thuringia is notably above the German average of 11.2%, reaching over 17% in 2005. However, it still represents the lowest rate of all formerly East-German Länder. In 2004 of the 810,000 employees living in Thuringia

underrepresented among the unemployed. The potential shortage of skilled personnel has been aggravated since 2000 by the annual out-migration of about 5000 young adults (aged 20 to 30) mainly to the formerly West-German Länder.

The Thuringia government tries to foster the growth of the local high tech industry by supporting cluster initiatives, notably in engineering, solar energy, biotechnology, automobile production, micro-electromechanical systems, optics and optoelectronics. Due to the traditional focus on manufacturing the share of jobs in medium-high and high-tech manufacturing is above the EU average, whereas the share of

**Table 4: Situation of Regions Selected According to Typologies from Other Sources<sup>8</sup>**

	Own (based on ESPON) <sup>i</sup>	European Innovation Scoreboard <sup>ii</sup>			Peripherality Index <sup>iii</sup>		DIW/ EPRC Cluster <sup>iv</sup>	Regional Innovation Capacity <sup>v</sup>
		RNSII	REUSII	RRSII	Car	Lorry		
Pomorskie	Lagging	0.51	*	*	*	*	agriculture biased	tertiary growth potential
Malopolskie	Lagging	0.53	0.29	0.35	*	*	agriculture dominated	tertiary growth potential
Bratislavsky Kraj	Lagging	1.00	0.54	0.66	*	*	service dominated	capital regions
Východné Slovensko	Lagging	0.25	0.17	0.19	*	*	agriculture biased	skilled manufacturing
Estonia	Potential	0.49	0.35	0.38	*	*	agriculture biased	tertiary growth potential
Schleswig-Holstein	Sluggish	0.33	0.49	0.45	intermediate, > average	intermediate, < average	service dominated	*
Thuringen	Lagging	0.42	0.57	0.53	central	central	industry	*
Mellersta Norrland	Leading	0.22	0.59	0.50	extremely peripheral	extremely peripheral	service biased	*
Sydsverige	Leading	0.45	0.86	0.76	extremely peripheral	very peripheral	industry	*
Piemonte	Sluggish	0.55	0.47	0.49	intermediate, > average	intermediate, < average	industry	*
Sardegna	Sluggish	0.21	0.23	0.23	extremely peripheral	extremely peripheral	service biased	*
Navarra	Lagging	0.59	0.45	0.48	very peripheral	peripheral	agriculture biased	*
Extremadura	Lagging	0.15	0.18	0.17	very peripheral	very peripheral	agriculture biased	*
South Yorkshire	Potential	*	*	*	central	central	service dominated	*
East Anglia	Leading	*	*	*	intermediate, > average	central	service biased	*
Borders, Midlands & W	Potential	0.30	0.37	0.35	extremely peripheral	extremely peripheral	agriculture biased	*

75,000 commuted to a workplace in Bavaria, Hesse or Lower Saxony. These commuters have taken pressure from the labour market, and created purchasing power even in the most peripheral regions of Thuringia. People living in districts close to the former intra-German border make particular use of the possibility to commute, which has resulted in a sharp east-west gradient in unemployment rates within Thuringia.

Despite the high level of formal education in Thuringia – 10% of the adult population have completed tertiary education – and the high unemployment rate, there is a potential lack of skilled workers especially in the technology sector, as persons with university degree are

the workforce employed in high-tech services reaches less than half of the EU average. Nevertheless the total amount of public R&D spending relative to GDP reached 123% of the EU average in 2002. The use of the internet by households in Thuringia is three percentage points below the German average of 58.2%, but only two other NUTS 2 regions in the formerly East-German Länder reach a higher Internet penetration rate. Only 35% of internet users in Thuringia have broadband access.

In common with most of the other regions in former East Germany, Thuringia is classed as 'laggard' in our own ESPON-derived typology. ICT use by households, however, is relatively high, and the regional government is very active in expanding the ICT infrastructure and fostering the use of ICT by enterprises. The central actor in

<sup>8</sup> For brief explanation of typologies, see endnotes on page 18.

facilitating the use of ICT and fostering innovation in Thuringia is the 'Stiftung für Technologie, Innovation und Forschung Thüringen (STIFT)'. In addition to other projects there are 11 public business incubators supporting technology start-ups by providing premises, management coaching and technological infrastructure.

## Italy

As is well known, the key regional division in Italy is between the north of the country and the south. This division is clear on most headline development indicators such as GDP, economic activity rates and unemployment. In terms of our own ESPON-derived typology there are only two categories of region, sluggish and lagging, the northern regions falling into the former category and the southern falling mainly into the latter. It was obvious, therefore, to select one northern region and one southern. We could have selected any of the northern regions, based on our own ESPON-derived typology. We selected Piemonte as a region with above national levels of innovation performance, but which is wrestling with problems of transition from manufacturing. The southern exceptions in our own typology are Lazio and Sardinia. The former's performance can be attributed to its status as capital city. It is less clear why Sardinia should have 'high ICT intensity' and we have selected Sardinia as a potentially interesting case.

## Piemonte

Piemonte lies in the north west of Italy and is surrounded by mountains on three sides. The region is divided into eight provinces. The population is around 4.3 million. The regions population density is below the national average, though population densities are well above the national average in the northern industrial/urban belt. Half the population is located in the Turin province, with about one quarter of the population based in the capital city. After several years of decline, followed by stagnation, there now appears to be indications of population growth. This growth appears to be the result of inward migration and the rate of natural increase remains relatively low.

Per capita GDP is above the national average and well above the European average (though it suffered a significant decline in the period 1999 – 2003). The region makes a disproportionately large contribution to national GVA. Unemployment in the region is well below national levels, though it is higher than that of most other northern Italian regions. A notable feature of the labour market in recent years has been the recruitment of immigrants from non-EU and NMS countries. Much of this is accounted for by the 'emergence'

process where the status of existing migrants was regularised.

Manufacturing has traditionally dominated the region's economy and the region is still classed as a high GDP/manufacturing region. According to Eurostat data, employment in industry, in 2002, remained well above the national level and service employment below the national level, though the balance has moved further in favour of services since then. Important manufacturing branches are automotive design and automation, textiles, ICT, aerospace, and food and wine. Important service sectors include banks and insurance and tourism. Agricultural employment is below national levels. In broad terms there is a north-south divide in the region with the north being mainly industrial and the south being agricultural, though there are industrial centres in southern areas which to some observer reflect a 'second wave of industrial development'.



Piemonte performs above the national and European averages in terms of innovation performance. The region describes itself as a 'pole of knowledge intensive business'. Piemonte is at the forefront in strategic high technology sectors such as telecommunications, ICT and the aerospace industry, with a number of research centres operating in these sectors, Turin in particular hosts a number of centres of excellence.

Piemonte is classified as a 'sluggish' region in terms of our own ESPON-derived typology (all Italian regions fall into either the sluggish or lagging categories). More recent data collected at the national level<sup>9</sup> suggests that uptake of the internet and broadband amongst individuals and households is at a lower level than the European average, but that the figures for enterprises are above the European average. Up-take is, however, higher than the national average in both cases.

<sup>9</sup> See *Sistema Piemonte (2006) 'A Statistics focus on Piedmont: Access and use of the Internet among households, enterprises and local governments'*, December 2006.

The region has been active in regional information society and knowledge policy for a number of years, and since 2004 has had an ICT observatory in place. There is currently a plan (dubbed WI-PE) to roll out broadband throughout the region. This reflects regional imbalances in the availability and uptake of broadband between densely populated and sparsely populated areas<sup>10</sup>. Piemonte is partner in the ERIK, UNDERSTAND and IANIS+ networks, and was a founder member of the RISI initiative.

### Sardegna (Sardinia)

The Island of Sardinia and its surrounding islands is an Autonomous Region with “Special” Statute. Cagliari city is the capital. The Region has eight Provinces and 377 Municipalities and has around 1.6 million inhabitants. Its population density stands at about one third of the Italian average. This is to some extent accounted for by low rural densities. The major population centres are Cagliari in the south and Sassari in the north. The population is mainly based in the south.

GDP per head is well below the national average. Agriculture employment is well above national levels, but below levels of several southern regions. Pastoral farming and other forms of livestock rearing outweighs arable farming considerably. Industrial employment is well below the national average. The main industry bases are heavy energy intensive industries such as oil refinery, petrochemicals and metallurgy and in port facilities to meet the requirements of these industries. High levels of employment in services is partly related to the growing level of tourism and State employment. Sardinia has low levels of employment participation in relation to the national level, with female employment being particularly low, though the gap seems to be closing. The unemployment rate is well above the national level.

Sardinia is classed as ‘sluggish’ under our own ESPON-derived typology, but interestingly, however, it has ‘high ICT intensity’ and therefore may form an interesting case study. The region is classed as having low levels of innovation compared to both European and Italian averages. The region has been involved in a number of IS/KE initiatives in a number of areas. In terms of e-government, the SIL-Sardinia initiative aims at using ICT to improve labour market information flows, while *Comunas*<sup>11</sup> aims to improve public services for citizens and improve efficiency of service delivery of those services. In terms of economic development the *Polaris*<sup>12</sup> initiative includes, inter alia, an ‘incubator farm’ which

<sup>10</sup> See *Sistema Piemonte* (2006)

<sup>11</sup> <http://www.comunas.it/>

<sup>12</sup> <http://www.crs4.it/ict/dart06/slides/marcheschi-en.pdf>

seeks to promote ICT firms. This project involves a range of actors including universities.

### Poland

Poland is divided into 16 voivodships, which are NUTS 2 regions. The decentralisation reforms of 1999 gave regional governments full economic development responsibilities for the regions. There is a divide between regions in the west central and eastern regions (Warsaw excepted) in terms of the headline indicators, such as GDP per head. There are also sizeable inter-regional differences which become obvious when NUTS 3 and lower levels are considered. In terms of information society the evidence for regional disparities is mixed and the data upon which judgements can be based is limited. All Polish regions, apart from the Warsaw region, are considered lagging in terms of our own ESPON-derived typology.



A study by Olechnicka et al.<sup>13</sup> shows a rather messy pattern of regional differences within Poland in terms of uptake and use of ICT. A secondary analysis (of the limited available data) carried out at the national level by Piatowski<sup>14</sup>, suggests that, in broad terms, there is a regional digital divide and that this mirrors the more general regional divide referred to above. Again, on a finer scale, however, interregional divisions between large city, urban and rural become apparent in most regions. Piatowski suggests that the western/central–eastern divide could also be thought of as an urban-rural divide.

We have selected our case study regions to reflect the west/central-east divides, focusing on one region in the north, Pomorskie (PL63), and one in the south east Malopolskie (PL21).<sup>15</sup> There are a number of contrasts and some similarities between these regions. Their histories suggest different cultures. Pomorskie was/is closely linked to Germany but also the Baltic in general and was

<sup>13</sup> See: *ESPON Project 1.2.3. Final Report, Appendix I g.*

<sup>14</sup> Piatkowski, M. (2004) ‘Factors and Impacts in the Information Society: A prospective analysis in the Candidate Countries: Report on Poland’, Brussels: CEC DGJRC.

<sup>15</sup> Though note that the boundary between west/central-eastern is not clear. Guzik for instance places Malopolskie on the ‘western’ side of the digital divide boundary (see Piatowski, 2004, p107)



part of the Hanseatic League. Malopolskie is more self contained, but has historic links with Austria. Pomorskie is (just) above the national average in terms of GDP per capita and Malopolskie well below. The regions also have different industrial structures. The picture is mixed in terms of ICTs. As mentioned above, all Polish regions, bar Mazowieckie, are classed as lagging in our own ESPON-derived typology, but recent national studies point to differences between regions (as well as within). According to analysis by Olechnicka and colleagues Pomorskie is one of the leading regions in terms of individual and household uptake (computer access and internet access), whereas Malopolskie is mid-ranking. In terms of enterprises, however, the two regions are both amongst the leaders, with Malopolskie ahead on some indicators.<sup>16</sup>

There are some similarities between the regions. For example, although Pomorskie is more urbanised, both regions have significant rural areas and differential rates of development between urban and rural settlements characterise both (in common with most Polish voivodships). They both host important universities. Both have developed IS initiatives within the context of regional development strategies. The fact that both have clear IS initiatives and that both regions have shown interest in being involved in our study are important factors behind their selection.

### Pomorskie

Pomorskie Voivodship is located in the north of Poland on the Baltic Sea. Its capital and largest city is Gdansk. Gdansk together with Gdynia and Sopot form a large urban agglomeration known as the Tri-cities. This area hosts over a third of the region's population. The other significant urban centre is Slupsk in the north west of the region. Overall density levels are around average for the country, but levels range significantly within the region, as Pomorskie has both a high level of urbanisation and large areas of scenic and protected natural land with low population densities. There are significant differences within the region in terms of structure of employment, rates of unemployment and so on. The population is ageing, with a growth in those post-working age in recent years. At the same time, population levels are increasing due to natural increase and inward migration.

The service sector is the main employer in Pomorskie; its relative size is above the national average and it generates the largest share of GVA. Employment in industry remains significant and is, again, above the national average. A process of restructuring is underway (or is needed) in much of the manufacturing sector.

Much of the activity in these sectors is connected directly or indirectly with the major port facilities in the region.

A number of foreign companies have located electronics production facilities in Pomorskie, at least partly as a result of its economic zone status. These include: Flextronics (USA), Philips Consumer Electronics (Netherlands) and Gemplus (France)<sup>17</sup>. Levels of agricultural employment, by contrast, are well below the national average. Unemployment is above the national level, though levels vary between the Tri-cities and other parts of the region.

As with all other Polish regions except the Warsaw region Pomorskie is classified as a 'lagging' region in our own ESPON-derived typology. It is unlikely that more recent data (were it available) would lead to different outcomes.<sup>18</sup> The limited available regional data gathered within Poland does, however, suggest that it is one of the leading regions in terms of use by households and individuals. Pomorskie has a higher than the national average use of home computers and was one of the three fastest growing regions in terms of home computer use during the period 2001-2003 and had proportionately the highest share of households with internet access. Enterprises seem comparatively less advanced, falling into the middle category. Pomorskie is one of the two most advanced regions in terms of implementing e-government according to a report from the eUSER study<sup>19</sup>.

Gdansk, the capital of Pomorskie, has developed an information society strategy known as eGdansk. The strategy is set in the context of the EU Action Plan and the national strategy and mirrors the priorities set out in these plans, with infrastructure, economic and social components being important. Social inclusion elements include helping the disabled, e-learning and telework. A number of partners are involved in the strategy including the City administration and the local universities<sup>20</sup>. The availability of advanced communications is confined to the urban areas of the region. At the regional level there is a plan in place to roll-out broadband to rural areas. Gdansk Science and Technology Park is one of several 'science parks' established in Poland as part of its economic development strategy. The Gdansk park targets a number of sectors including ICT.

<sup>16</sup> ESPON Project 1.2.3. Final Report, Appendix I g., pp-8-11

<sup>17</sup> Centre for Industrial Management, Polish Academy of Sciences (2003) 'Pomorskie Voivodeship Report'.

<sup>18</sup> See: ESPON 1.2.3, Final Report, Appendix I g for commentary on the continuing dearth of regional IS data in Poland.

<sup>19</sup> Jensen, L. (2005) 'Country Brief: Poland', eUSER project document, [www.euser-eu.org](http://www.euser-eu.org).

<sup>20</sup> See [www.tartu.ee/data/Tartu\\_information-society-in-Gdansk\\_bo.ppt](http://www.tartu.ee/data/Tartu_information-society-in-Gdansk_bo.ppt)

## Malopolskie

Malopolskie is located in the south-eastern part of Poland and is bordered by Slovakia to the south. The regional capital and largest city is Krakow. The region is significantly below the national average in terms of urbanisation (49.7% versus 61.4%). It has the second highest proportion of population in rural areas of all Polish regions. The highest densities are in Krakow where one third of the region's population is located.

The region is described as 'moderately developed' and has below national average GDP per capita values. There are, however, significant differences in performance within the region with Krakow in particular performing well above national levels on key indicators. The Malopolskie region is one of the most diversified in terms of the economic development of regions in Poland and is often described as 'having potential'.

The region's employment rate is above the national average and the unemployment rate is the lowest in the country, though unemployment affects the young as in other regions. Malopolskie's has above average employment in agriculture (23% in 2006). Employment in industry is around the national average, the most important industries being traditional heavy industries, including the steel, heavy chemical, mining and metal industries, though a number of new industries are emerging, including industries associated with the information economy – cable, telecommunications, computing and pharmaceuticals. Recent inward investors include Motorola and Delphi. Services account for around 50% of employment, slightly below the national average.

Malopolskie was one of the first two regions in Poland to develop the 'gateway' concept under the national 'Gateway to Poland' programme, establishing a portal in 2002 as part of the region's regional development strategy, with the goal of providing services and information to the public and improving the efficiency of public administration. A 'Małopolska E-Administration System Extension' was subsequently developed to further extend the development of e-government. The initiative had four elements: e-procurement systems, workflow systems for administration offices, a network of PIAP's, particularly focusing on access in rural areas and implementation of digital signature in Malopolskie offices<sup>21</sup>. In economic development terms Malopolskie, in its Regional Innovation Strategy targets the IT and ICT industries as potential growth areas. Malopolskie is an observer member of IANIS+.

<sup>21</sup> <http://www.malopolskie.pl/emalopolska/Eng/>

## Slovakia

Slovakia is one of three Member States selected for analysis. It offers a contrast with the other two selected NMS, Estonia and Poland. The most obvious contrast with Estonia is differing geographical location and consequent external linkages. Whereas, Estonia 'represents' the Baltic NMS, Slovakia 'represents' the smaller Central-East European states. The most obvious contrast with Poland is the different sizes of the two countries. An additional reason for selecting Slovakia is that our Slovakian consortium partner ensures local knowledge and access.

Slovakia is divided into four NUTS 2 Regions: Bratislavsky Kraj, Zapadne Slovensko, Stredne Slovensko and Vychodne Slovensko. We have selected two of these for study. The first, Bratislavsky Kraj (SK01) is the capital region of Slovakia. We have generally avoided selecting capital regions as, in most countries, it is difficult to make comparisons with other regions, because of the greater capacities and attributes which capitals have as a result of their role. Having considered developments (or lack of developments) in respect of IS in other Slovakian regions, we considered that it might be more useful to explore the apparent dynamism of Bratislava in European terms, and RIC which lies behind this, rather than exploring two of the other three of the Slovak regions where there are limited developments.

Slovakia is a small country but has one of the biggest regional divides in the EU. The regional divide runs west to east and we have therefore selected Vychodne Slovensko (SK04) the most easterly and poorest region in Slovakia as our second case study.

Our own ESPON-derived typology suggests that from a European perspective all regions fall into the 'lagging' category. However, studies at the national level suggest that there are differences in ICT uptake between the various NUTS 2 (and NUTS 3) areas, as well as between urban, suburban and rural areas<sup>22</sup>. It is likely that at least Bratislava would be reclassified upwards were more recent data factored into our own typology.

### Bratislavsky kraj (Bratislava Region)

Bratislavsky kraj lies in the south west of Slovakia and is bordered by Austria and Hungary. The region is the smallest in Slovakia both in terms of size and population, but, it contains the capital, Bratislava, which is also the largest city and this gives the region by far the highest levels of

<sup>22</sup> See, for example, Plintovicova, D. (2003) 'Uroven rozvoja Internetu na Slovensku'. In: 26<sup>th</sup> World Telecommunication Day International Conference (Conference Proceedings), Slovenska Electrotechnica Spolocnost, Banska Bystrica, pp. 101-106. See also ESPON 1.2.2 Third Interim Report, August 2003.

population density. The population is ageing and there has been an outward flow of people from the capital to its hinterland.

The region is by far the wealthiest in Slovakia and GDP per head is more than twice the national average and close to three times that of our second Slovak region Vychodne Slovensko. It has the highest level of economic activity and the highest average monthly wages. It also has the lowest rates of unemployment in the country with unemployment standing at 5.3% in 2005. As with many other European regions there are high levels of unemployment among the young. In addition to its dominant position in Slovakia Bratislavsky kraj is the second wealthiest region in East-Central Europe after Prague, and is above the EU25 average.

Bratislavsky kraj's economy is dominated by the service sector. The level of service employment for Slovakia stands at 55% whereas in Bratislavsky kraj the almost three quarters of employment is in this sector. This reflects the concentration of national government service (though public service employment is in decline), business and financial services and higher education in the capital region. Manufacturing still plays an important, though declining, role in the region, with chemicals, auto, machinery and food industries dominating. There is a growing demand for more highly skilled and qualified employment, as both industry and services restructure.



Although Bratislavsky kraj is classified as 'lagging' in our own ESPON-derived typology there is evidence that this situation may be changing. A programme of infrastructure investment in 2003 has increased broadband supply and both T-Mobile and Orange have built mobile networks. Evidence from national studies suggest that Bratislavsky kraj has higher levels of up-take of certain services (such as the Internet) than do other regions, though there are also differences within the region. As would be expected the capital region also has higher levels of innovation than the rest of Slovakia, with more than 40% of the county's R&D. The region is leading performer in innovation in the NMS (second only to Prague) and performs well compared to the majority of OMS regions<sup>23</sup>. The region is involved in a number

of European partnerships. The region has the highest concentration of tertiary educational institutions in the country and hosts over 40% of the country's full time students.

The Regional Development Strategy for Bratislava published in 2003 identifies competitiveness and the support for innovation among the main priorities for economic development. The concrete measures envisaged by the Strategy include the diffusion of innovative technologies into the regional economy through innovation centres, science & technology centres and business & technology parks. The creation of clusters of technology-orientated firms also features among the aims. These aims are also echoed in the Regional Innovation Strategy (published in 2004) which, in addition, makes explicit references to the concept of the 'learning region' and the 'knowledge-based society'. Both documents support the idea of the 'EuroValley', a proposed network of innovation zones in the Western part of the region. It would be valuable to see how the implementation of these objectives is progressing in the context of a continued economic transformation.

### Vychodne Slovensko (East Slovakia)

Vychodne Slovensko is the most easterly NUTS 2 region in Slovakia. It comprises two NUTS 3 regions, Kosice and Presov. It borders Poland, Ukraine and Hungary. Vychodne Slovensko is the poorest region in Slovakia and is in the poorest ten regions in the EU. It has a diverse geographical landscape and a range of natural mineral resources. The main urban centre is Kosice which is the second largest city in Slovakia. The region has experienced population growth due to natural increases, though this is countered to some degree by outward migration. Whilst the region has the highest share of under-25s in Slovakia, it has the lowest proportion of those between 25 and 65.

Vychodne Slovensko has the highest rates of unemployment in Slovakia, with high levels of long-term unemployment. In 2005 unemployment levels stood at 23.1%. The service sector is the main employer in the region, with two economic activities, wholesale and rental and real estate, renting and business activities being the principal tertiary activities. Manufacturing employment remains important, however, and a range of heavy and light manufacturing industries have a presence. There is some evidence of new industries moving into the region. T-Systems, part of Deutsche Telecom, has located a 'client service centre' in Kosice. It is anticipated that this will create 500 jobs by 2008, many of them graduate

<sup>23</sup> See Muller, E. et al. (2006) 'A regional typology of innovation capacities in New Member States and Candidate Countries',

Working Papers 'Firms and Regions' No. R1/2006, Fraunhofer Institute Systems and Innovation Research.

jobs.<sup>24</sup> The region is classed as agriculture biased (DIW/EPRC) in terms of cluster, but only 6.5% of employment is in this sector.

In common with other Slovak regions, Vychodne Slovensko is classed as laggard in our own ESPON-derived typology. However, its main city, Kosice, was selected, together with Bratislava and Banska Bystrica, for early roll out of ADSL broadband (June 2003) and mobile phone networks have also been extended in recent years<sup>25</sup>. The region performs worst of all Slovak regions in terms of innovation (as measured by innovation scoreboard) and is amongst the poorest twenty performers in Europe. However, there is evidence of initiative taking place. For example, "Kosice IT Valley", has created a 'development forum', bringing together the regional authority, Kosice city municipality, local universities and IT firms<sup>26</sup>. This initiative has fairly broad goals which include further education for ICT professionals, but also increasing ICT skills among the general population.

## Spain

Spain is one of the few countries which hosts all of our typology types. Ten of the seventeen regions are classed as lagging, three as sluggish, two as having potential and two as being in the vanguard. We have selected one lagging region, Extremadura (ES43) and one vanguard region Navarra (ES22). These regions contrast in terms of GDP and earnings, with Navarra having above national levels, while Extremadura is well below. Navarra has a more developed industrial base. Navarra has a high innovation score in terms of Spain and is in the middle ranks of Europe, whereas Extremadura is amongst the lowest.

### Extremadura

The autonomous community of Extremadura is located in the west of the country and borders Portugal. Administratively, it comprises two (NUTS 3) provinces, Cáceres and Badajoz. The latter is larger and contains the region's capital, Mérida.

Extremadura has one of the lowest population densities in Spain and the population outside the three main cities, Merida, Badajoz and Caceres, is widely scattered. The region's population is ageing, with both low birth rates and low inward migration. Out migration of young people is a long-standing phenomenon. Extremadura is regarded as 'very peripheral' in terms of

accessibility, a function of its location, but also of its poor transport infrastructure, though motorway connections have improved since the 1990s.

The region is poor, GDP per head is well below national levels, and was classified as Objective 1 in the 2002-2006 programme period. Agriculture continues to play a dominant role and Extremadura is classified a low knowledge, agriculturally-biased region in European terms (see Table 4). The region has a higher proportion of the workforce employed in agriculture than any other Spanish region, with levels standing at with 13.5%. Unemployment is proportionately higher amongst registered agricultural workers. In addition the agri-food sector is the main industry in terms of employment and exports. The service sector is the largest single employer (61%) with levels just below the national level. Economic activity rates are low, particularly amongst women. Unemployment is well above national levels. Unsurprisingly, wages are amongst the lowest in Spain.



In terms of our own ESPON-derived typology Extremadura is a lagging region. It also has amongst the lowest scores in terms of innovation capacity in Europe. Notwithstanding its laggard status, the region has an active information society policy. The region's Regional Programme of Innovative Actions (RPIA) sought to create an e-Extremadura. In addition to creating a regional infrastructure, notably the Extremadura Intranet, the programme aimed to create and adapt digital content for citizens, improve digital literacy, and promote a new business and labour culture around ICT<sup>27</sup>. The region has also been involved in a number of European projects and in a number of European networks in the information society field including IANIS+.

### Navarra

Navarra is located in the north-east of Spain, in the shadow of the western Pyrenees. It is an autonomous community consisting of a single

<sup>24</sup> Balaz, V. (2006) 'Slovakia: Large IT investment in the eastern region', TrendChart Newsletter, March 2006, <http://trendchart.cordis.lu/>

<sup>25</sup> See ESPON 1.2.2, Third Interim Report, August 2003, Chapter 4.

<sup>26</sup> Balaz, V. (2006)

<sup>27</sup> see <http://cordis.europa.eu/spain/extremadura.htm>

province only. The region's capital is Pamplona. Historically, the region has enjoyed a good measure of independent authority. Population density is below the national average, though this varies within the region, with around half the population living in the Pamplona metropolitan region. These population differences are reflected in the differential nature of economic structure, employment and social problems. The region has experienced population growth mainly due to inward migration. Nevertheless, the region has a disproportionate number of citizens over 50 years of age. The region is regarded as very peripheral due to its location and transport infrastructure.

The region's GDP is higher than that of most Spanish regions. Although the service sector is the largest single employer, and largest contributor to GVA and is the fastest growing sector in Navarra (apart from construction which relies heavily on public sector contracts) employment in the sector is below the national average. Industry still plays a significant role, with employment rates (and contribution to GVA) above the national average, though employment in industry is in decline. The economy is dominated by SMEs in terms of industry size, but is regarded as being excessively reliant on outside capital. For example, the auto industry, a key industrial sector, is dominated by Volkswagen and its suppliers.

In terms of our own ESPON-derived typology Navarra is one of two 'vanguard' regions in Spain (the other being Catalonia). Navarra has a well-established Information Society governance infrastructure including the Dirección General para la Sociedad de la Información and an information society observatory. The ICT sector is seen as key cluster in the region's strategy.<sup>28</sup> A key element of the region's Information Society Plan is to use ICT to reform the regional administration and improve public services. The region has undertaken a number of projects and is involved in a number of European IS/KE networks.

## Sweden

Sweden is selected to represent the northern periphery of the Union. A range of studies show Sweden to be one of the most advanced countries in terms of information society and knowledge economy, not only in Europe, but also globally<sup>29</sup>. According to our own ESPON-derived typology all Swedish regions are classified as vanguard or leading regions. This pattern is in line with other socio-economic indicators, such as GDP per head, where regional differences within Sweden are less extreme in most other European countries. In broader European terms the two

selected regions look rather similar. Within their national context, however, Mellersta Norrland (SE07) and Sydsverige (SE04) do differ in a number of respects, including: population density, location and degree of peripherality and (detailed) industrial structure. A key difference for TRANSFORM is their respective levels of innovation. Here Sydsverige is considerably more advanced than Mellersta Norrland and is likely to become more so as the benefits of belonging to the 'Øresund 'region' evolve.

### Mellersta Norrland

Mellersta Norrland is located in northern Sweden. It comprises two counties, Jämtland and Västernorrland, and 15 municipalities. It is a heavily forested region. It has the second lowest population density in Sweden and, therefore, one of the lowest in Europe, and is home to only around 5% of the Swedish population, with most of its population located on the coast. The region's population is in secular decline and the remaining population is ageing. In European terms, it is classed as an extremely peripheral region (see Table 4). The region had objective 1 status during the 2002-2006 programming period even though the region has well above EU15 GDP average and performs better in this respect than several Swedish regions.



In terms of industrial structure, and in line with the rest of Sweden, the majority of employment is in the service sector. Tourism has been a particularly rapidly growing industry. Paper, pulp, wood products, chemical products and hydropower remain important industries in Mellersta Norrland, though new production activities (including logistics, telecommunications and biotechnology) have entered the region in recent years. These sectors are dominated by MNE establishments.

<sup>28</sup> <http://www.cfnavarra.es/Observatorios/index.HTM>

<sup>29</sup> See, for example, CID, Harvard's Network Readiness Index.

In terms of the ESPON-derived regional classification Mellersta Norrland, in line with all Swedish region, is a leading region. In European terms, Mellersta Norrland performs reasonably with respect to innovation. In Swedish terms, however, the region is a poor performer relative to other regions. The region has been involved in a number of information society projects, particularly around e-governance. It is also involved in external networks including UNDERSTAND and eris@.

### Sydsverige

Sydsverige (Southern Sweden) consists of two counties, Blekinge and Skåne and has 38 municipalities. It contrasts with Mellersta Norrland in a terms of location, south versus north. It also contrasts in terms of population density, with the second highest population density (92.7 inhabitants per km<sup>2</sup>) after the Stockholm region. The region is experiencing steady population growth. Sydsverige's location and also its history (it was once part of Denmark) orients the region towards Denmark. This has been reinforced since the bridge over the Strait of Øresund was built.

The service sector dominates the economy in terms of employment. Although industrial employment has fallen to around 24% it is still well above national levels and there are still very important industry clusters, including, recently, the ICT sector<sup>30</sup>. Although over 80% of the region's land is dedicated to farming and forestry less than 3% of employment is in agriculture.

Levels of self-employment and firm formation are high in most of Sydsverige as is the rate of firm start up. Levels of innovation are high (0.76 on RRSII) in relation to the Swedish and European averages. There are important technical educational establishments notably Malmö University and Blekinge Institute of Technology. In terms of our own ESPON-derived typology, in line with all Swedish region, Sydsverige is a leading region.

### United Kingdom

The UK is one of the few European countries which has the full range of region types under the ESPON-derived typology. We have chosen two contrasting regions: the first, South Yorkshire (UKE3), a region which is classed as 'potential', the second, East Anglia (UKH1), is classed as a 'leading' region. Within the UK context these regions provide contrast on a number of dimensions, including: per capita GDP, industrial and employment structure, urban structure, levels

of employment/unemployment and knowledge economy assets.

### South Yorkshire

South Yorkshire was briefly a Metropolitan County, but since 1986 when the County was abolished it has had no formal political or administrative status, though a number of 'joint boards' were created to oversee particular functions such as transport. South Yorkshire is now a sub-region Yorkshire and Humberside (Y&H), which is a NUTS 1 region. Regional policy is developed at the Y&H level. Yorkshire Forward, the Regional Development Agency is responsible for that policy. Policy regarded as being local is dealt with by the four local authorities Sheffield, Barnsley, Doncaster and Rotherham. The reality is complex, however, with local authorities being involved in the (unelected) Regional Assembly and in local regional partnerships, both of which are important in policy formulation.

South Yorkshire has a population of just under 1.3 million, most of whom are located in urban areas. The population fell during the 1990s, though there were some signs of recovery in the early years of this century. Population densities are about 2.5 times those of Yorkshire and Humberside and over three times the national average. The area is predominantly an urban county, the principal urban centres being Sheffield-Rotherham, Doncaster and the Dearne Valley. The area is very accessible, being defined as 'central' in the ASPIRE classification of peripherality. Mainly as a result of the decline in traditional industries South Yorkshire is one of the least prosperous regions in the EU15, a fact recognised by the granting of Objective 1 status during the period 2000-2006.

Traditionally, coal mining steel making and engineering dominated the South Yorkshire economy. Employment in industry remains well above the national average and steel and engineering still play a role in the economy, but both are in decline. Employment in the service sector is growing but remains below the national average. Non-market services are important, but a number of jobs have been created in financial services and newer areas of employment such as call centres in recent years. Unemployment is slightly above the national level.

South Yorkshire is classified as a potential region within our own ESPON-derived typology. Infrastructure is probably no longer the most pressing issue for South Yorkshire (in line with other urban areas). In 2006 it was announced that all exchanges in Y&H had been digitised, though supplier competition for advanced broadband and other services may be an issue in some places. The sub-region is now beginning to roll out second generation broadband. This process has

<sup>30</sup> Hansen, P.A. and Serin, G. (2003) 'The Development Potential of the ICT Sector in the Øresund Region', Øresund IT Academy.

resulted from public intervention using Structure Funds. Data is not available for South Yorkshire (as opposed to Y&H) regarding regional innovation performance. National studies, however, suggest that the region has low levels of knowledge intensive businesses (and is overdependent on the public sector for knowledge work) and low levels of knowledge skills in the UK context. The region thus provides a different setting from East Anglia (see below) in which to explore the transformative use of technologies.

Yorkshire and Humberside has been involved in a number of Information Society projects. Many of those funded under Objective 1 funding related to social inclusion objectives. For example e@syconnect and Jobnet<sup>31</sup>. Y&H is involved in UNDERSTAND and is implementing the indicator system at the sub-regional level. Y&H is a member of IANIS.

### East Anglia

East Anglia is a (NUTS 2) sub-region of the East of England (NUTS 1). The East of England Development Agency (EEDA) is responsible for regional policy, but within a similar framework to that described for Y&H. In terms of administrative structures, East Anglia is made up of Cambridgeshire, Norfolk and Suffolk County Councils and the unitary authority of Peterborough.



There around 2.2 million people living in East Anglia. The region has experienced sustained population growth over the past 25 years, well above the national average. All council areas have grown at rates well above the national average. Population growth is due mainly to inward migration. This growth can be explained by different factors in individual parts of the sub-region. For example, Cambridgeshire has grown particularly rapidly (over 20%), mainly linked to its growing role in the 'knowledge economy' and its

<sup>31</sup> [www.jobnetshffield.co.uk/](http://www.jobnetshffield.co.uk/)

location within the London-Standed-Cambridge corridor. This growth is likely to continue. By contrast growth in parts of Norfolk can be accounted for by people retiring to the county.

The region remains sparsely populated in comparison to the national level. This is explained by the large proportion of land given over to agriculture and other tourist/leisure uses. The population is ageing. This is, in part at least, due to inward migration for retirement purposes. Recently migration has been boosted by workers from the accession countries arriving to take up a range of employment, notably in agriculture and processing. East Anglia is classed as intermediate/above average/central in terms on the ASPIRE typology.

The East of England's economy was ranked fourth in 2004 in terms of its contribution to UK output (constituting 9% of the UK total), with total Gross Value Added (GVA) of £89.4 billion.

East Anglia has a diverse economy. Measured at the sub-regional level, agricultural employment is just under twice as high as the national average. Certain parts of the region, however, particularly in Cambridgeshire Fens and Norfolk, are dominated by agricultural and associated employment, though overall employment in the sector is in decline in the sub-region. Manufacturing is also in decline though it remains above the national average. In line with the rest of the UK the service sector has grown and now accounts for over 70% of employment. Employment levels are well above national levels. Conversely, unemployment is well below the national average and this is true for all but a handful of districts.

East Anglia is classed as a 'leading' or 'vanguard' region in terms of our own ESPON-derived typology. The sub-region (and its 'parent' NUTS 1 region the East of England) also perform well in terms of broader information society/knowledge economy indicators. Much of this can be attributed to the success of 'knowledge economy' clusters such as biotech, life sciences and ICT.

A regional strategy is in place for the East of England and there are a number of information society projects underway in East Anglia, including e-government projects such as 'Norfolk Open Link' Community Wireless Network<sup>32</sup>.

### Ireland

#### Border, Midland and Western (BMW)

Like the Estonia case study, this proposed case study diverges from our standard template of two contrasting regions within a country. Here we

<sup>32</sup> See [www.norfolkopenlink.com/](http://www.norfolkopenlink.com/)

intend to look at one of the two NUTS 2 regions which constitute the Republic of Ireland's national space. Clearly we will explore BMW in its national context and the importance of national policy will be crucial in what remains a relatively centralised state. The rationale for the case study is as follows. Ireland has been one of fastest growing economies in the Union over the past ten years. It has emerged from being what was widely regarded as a peripheral, 'backward' European country in terms of economic development, recognised by its 'cohesion country' status, to being an advanced economy, in a relatively short period. A number of NMS currently face similar challenges to those previously faced by Ireland. Clearly coming to terms with new technology has become an important element in economic growth in the past few years and this study will explore whether and how Irish regions have embraced ICTs in transformative ways. Different Irish regions have experienced different rates of economic growth, and to a large degree BMW operates in the shadow of South and Eastern (S&E), and particularly Dublin, and Ireland is now seeking more balanced development. By exploring the TRANSFORM issues in this lesser developed region we hope to draw out policy lessons which might be applicable to less developed regions in the shadow of a dominant capital.

BMW consists of three NUTS 3 regions, which map onto the Irish administrative structure (NUTS 2 is for statistical purposes only). The three NUTS 3 regions are Border in the north of the Republic, Midland, the area around Shannon, and Western, which includes Galway, the third largest city in Ireland. A Regional Assembly was established for BMW which is composed of 29 nominated elected representatives.

BMW is a rural region, with a weak urban structure, and is classed as extreme periphery under the ASPIRE typology. The region has experienced a significant population increase over the past ten years. Growth levels are slightly less than the national level, but the growth trend contrasts with population loss which the region has traditionally suffered. Population densities remain low overall.

As in most European regions the service sector provides the majority of work, though service employment is well below that in the S&E region and agriculture and industry (11% and 31% respectively) are still relatively important. Unemployment is above the national average, though low by current European levels. The region has attracted significant levels of FDI.

Our own ESPON-derived typology classifies BMW a potential region from the perspective of ICT uptake. The region also has some human capital potential in a young population, a large number of

graduates a developed system of tertiary educational institutions. There have been a number of ICT/information society/knowledge economy initiatives in the region. These include Ennis Information Town and a Broadband Regional Strategy. The region (or its constituent parts) is involved as a partner in a number of European projects including those using ICT to enhance public service delivery (e.g., Citizens First) and the promotion of new technologies in rural areas.<sup>33</sup> BMW is involved in IANIS and eris@.

## Estonia

The reasons we have selected Estonia are set out in section 2.1 (above). Our focus is likely to be Tallinn and its surrounds, though we will pay attention to differences within the country. In this section, however, we focus at the country level, rather than contrasting regions within the country as we do with our other 'pen portraits'.

The Republic of Estonia lies on the shores of the Baltic Sea. It has an area of 43,342 km<sup>2</sup> and had a population of 1,349,000 in 2004. Thanks to its geographical location, Estonia forms an important link between east and west. In the east, Estonia is bordered by the Russian Federation. To the north and west, Estonia borders on the Baltic Sea, and in the south on the Republic of Latvia.



The Republic of Estonia consists of 15 counties with 39 cities and 202 rural municipalities (as of 1 January 2003). Estonia is NUTS 2 at country level. It has five NUTS 3 regions, but these have statistical significance rather than administrative significance. The capital Tallinn is in the Põhja-Eesti region on the northern coast of the country. "The most striking feature of Estonia's regional development is the rapid development of the capital Tallinn in comparison with the rest of Estonia. This difference in development has become more pronounced in recent years, with Tallinn continuously attracting more foreign capital, investment, and tourists than other areas

<sup>33</sup> See: [www.iro.ie/midwest\\_region.html](http://www.iro.ie/midwest_region.html)



of Estonia. Banks, light industry, trade, and other service industries are concentrated here<sup>34</sup>.

Unemployment in Estonia stood at only 6.2% in (the 2<sup>nd</sup> quarter of) 2006 and the economy is said to be suffering from labour shortages. Many skilled workers are moving abroad to Finland, Sweden and the UK. The main problems faced by Estonia's labour market are the unemployment of young people, an ageing population, a disproportionately large number of inactive people and the fact that the skills and knowledge of the population of working age do not match the current needs of the labour market.

Estonia is being widely regarded as being a leading New Member State in terms of information society developments on a range of indicators of ICT production, ICT uptake and use by both consumers and citizens, and by enterprises. Indeed, the country outperforms several regions in the OMS countries and has a high networked readiness index<sup>35</sup>.

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<sup>34</sup> [http://forum.europa.eu.int/irc/dsis/regportraits/info/data/en/ee\\_national.htm](http://forum.europa.eu.int/irc/dsis/regportraits/info/data/en/ee_national.htm)

<sup>35</sup> See [www.weforum.org/](http://www.weforum.org/)

## Footnotes to Table 4 on page 6

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- <sup>i</sup> See TRANSFORM Deliverable 1.2
- <sup>ii</sup> All three indices are based on the variables: Tertiary education, Life-long learning, Medium/high-tech employment in manufacturing, High-tech employment in services, Public R&D, Business R&D, High-tech patents. RNSII = Regional National Summary Innovation Index, calculated using the average of the re-scaled relative to the country mean indicator values. REUSII = Regional European Summary Innovation Index, calculated using the average of the re-scaled relative to the EU25 mean indicator values. RRSII = Revealed Regional Summary Innovation Index, calculated as the weighted average of the re-scaled values for RNSII and REUSII. See Hollanders, H. (2006) 'European Regional Innovation Scoreboard (2006 RIS)', European Trend Chart on Innovation.
- <sup>iii</sup> ASPIRE peripherality indicators can be interpreted as an inverse function of accessibility, i.e. the higher the accessibility, the less peripheral a region is located and vice versa. The concept of potential accessibility was chosen here. Travel time matrices were calculated separately for passenger traffic and freight transport. These travel time matrices are used to calculate regional accessibility indicators, which are then converted to peripherality indicators (weighted for regional GDP). Normalisation (EU=100) resulted in the following classes: central regions (125+), intermediate regions, above average (100<125), intermediate regions, below average (75<100), peripheral regions (50<75), very peripheral regions (values 25<50), extremely peripheral regions (values 0<25). See Schürmann, C. and Talaat, A. (2000) 'Towards a European Peripherality Index. Final Report', ASPIRE project report, Dortmund: Institute of Spatial Planning.
- <sup>iv</sup> The European Policies Research Centre undertook a survey on the impact of EU enlargement on cohesion, i.e. on both current Member States and on Candidate Countries. This included an analysis of a wide range of regional disparities using, *inter alia*, a cluster analysis which identified six clusters at NUTS 2 level across a future EU 27: a) agglomerations, b) service dominated, c) service biased, d) industry biased, e) agriculture biased, f) agriculture dominated. The clusters are very unevenly distributed across NUTS 2 regions (e.g. almost all regions from the UK are in the first three clusters, while the latter three are much more common in southern Europe). See Weise, C. et al. (2001) 'The Impact of EU Enlargement on Cohesion – Final Report', Berlin and Glasgow: German Institute for Economic Research and European Policies Research Centre.
- <sup>v</sup> The typology results from a principal components analysis which has been employed in two successive steps. In a first step, regions are categorized according to their potential in terms of knowledge creation. To this goal, a synthetic factor "knowledge creation" has been constructed that integrates the following five original variables: R&D expenditure, R&D personnel, concentration of inventors, bioscience publications, and nanotechnology publications. In order to further differentiate the regions, in a second step a principal components analysis has been conducted using a set of twenty-one variables. The resulting five clusters are: Capital regions (group A), Regions with tertiary growth potential (group B), Skilled manufacturing platforms regions (group C), Industrially challenged regions (group D), and Lagging-behind agricultural regions (group E). See Muller, E. et al. (2006) "A regional typology of innovation capacities in New Member States and Candidate Countries", Fraunhofer Institute Systems and Innovation Research Working Papers Firms and Region No. R1/2006.