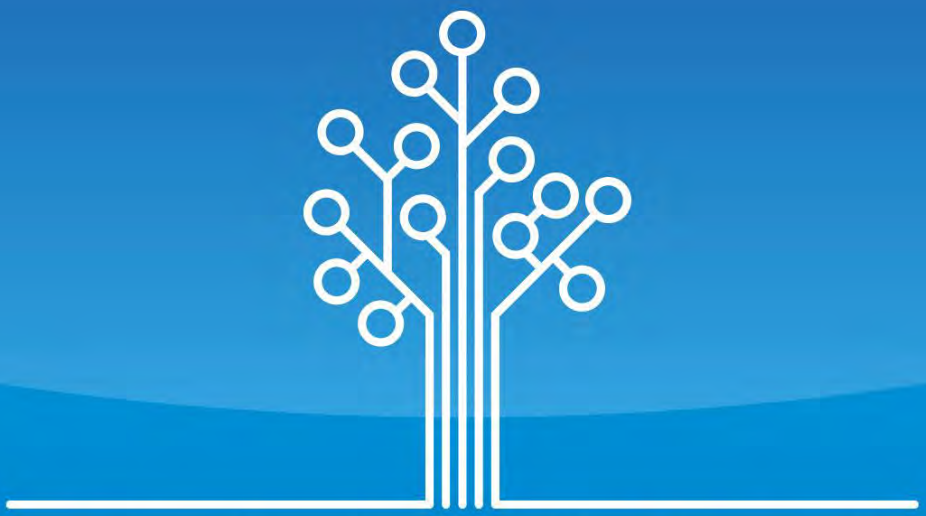

BORDWIIS+

Boosting Regional Development with ICT-Innovation-Strategies

Regional ICT Policies

INTERREG IVC
INNOVATION & ENVIRONMENT
REGIONS OF EUROPE SHARING SOLUTIONS

European Union
European Regional Development Fund

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Introduction

BORDWIIS+ project

Information and communication technology (ICT) is considered crucial to European competitiveness, innovation strength and industrial development, especially as innovation is often made possible by developments in advanced ICT and their applications. However, new policies and strategies are required to maximise the opportunities and meet the challenges that the rapid development of ICT creates.

Policy-makers are facing problems in identifying appropriate targets and means for implementing development strategies. They need support to develop policies that combine three fundamental factors:

- Strengths and assets in given region;
- Innovation policies focusing on the establishment and support of continuous innovation among SMEs;
- Interregional policies aimed at the most relevant technological areas.

BORDWIIS+ tackles this challenge with smart specialisation strategies. The consortium, consisting of 10 partners representing 8 regions with complementary ICT competencies and policies, aims to create the best environment for ICT innovation and business opportunities in strategic sectors for their respective regions and a blueprint for European regions in general.

Regional ICT Policies

BORDWIIS+ regions need to identify their policies in the very beginning in order to prepare for the final phase of the project when regions will decide how to integrate lessons learnt into regional policies through respective implementation plans. This is also an important phase considering that regional preconditions are crucial to pave the way for tailor-made strategies.

The identification of the policies addressed gives a general picture of each region's specific context and insight to the ICT-policy-strategies, as well as main innovation stakeholders and relationships among them.

Introduction

Aiming at a status quo description, all regions were asked to summarize their respective data concerning existing ICT policies and future plans, structured in four passages. The first passage with the headline "Broadband availability and future development" gives an overview not only about policies fostering broadband availability but also about the general public's internet usage and acceptance of new ICT-based products. The second passage "ICT Adoption in SMEs" points out policies concerning the region's ICT infrastructure and usage in businesses. If applicable, a brief overview on running projects or policies to support SMEs in adapting ICT innovation was included.

Already implemented ICT Innovation policies as well as future strategies are described in the third passage "ICT and ICT based Innovation. Finally, in the fourth passage "General Innovation Policies", regions may additionally comment on other projects or innovation policies, which could influence the evolution of the ICT sector in any way.

The results presented on the following pages highlight the regional strengths and weaknesses and will be used as a basis for the later cooperation concept.

Shaping the future through innovation
ICT.NRW
Cluster Information and Communications Technology

North Rhine-Westphalia (Germany)

Broadband availability and future development

North Rhine-Westphalia (NRW) is well aware of the economic relevance of modern data communication networks throughout the State covering the present and future needs of enterprises and consumers. The deployment of next generation high-speed fiber infra-structures is among the most relevant pre-requisites for safeguarding competitiveness and the innovative strengths of complete regions. The market forces fail to provide rural as well as urban areas with those next generation access networks that will be urgently needed to enable participation in Digital Life in the next decades. A further loss of locational quality and increasing emigration of enterprises and people might be the severe consequence of that.

Several municipalities and administrative districts have already started to meet this challenge by implementing their own broadband development plans. Anyway, it becomes clear that they do need corresponding strategic guidance, expertise and support from the State. For these and other reasons, broadband policies are now a vital part of broader ICT policy strategies and are receiving the same attention as other key economic policies.

NRW therefore has initiated a network of scientists, experts and consultants in order to:

- Develop new strategies, concepts and structures preparing and supporting NGA deployment projects based on joint efforts of larger numbers of municipalities;
- Develop, test and offer municipalities and administrative districts new and pre-tested instruments and methods that can be directly applied for systematical planning, setting up and implementation of NGA projects.

The BroadbandConsulting.NRW network is going to offer information, consulting and support to co-operatives of municipalities by:

- Providing information about opportunities for action;
- Providing support for developing large-scale concepts for broadband projects;
- Facilitating access to public subsidies and long-term public loans;
- Recommending and placing experts to deal with technological or legal questions as well as questions concerning business plans, organizational models and financing.

The Ministry for Economic Affairs, Energy, Building, Housing and Transport is responsible for the implementation of the ICT innovation policy. Also involved are the Prime Minister's Office, The Ministry for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection, The Ministry of Finance and The Ministry of the Interior and Municipal Affairs.

ICT and ICT based Innovation

Information and Communication Technology is the cornerstone and the most important driver for productivity and growth in North Rhine-Westphalia's economy. ICT industry in NRW is thus an important engine for employment and is one of the main contributors to the macro economy. The macroeconomic importance of ICT extends well beyond the sector. ICT prompts innovations, generating growth and finally creating future-proof jobs in almost every sector. Because of this, these technologies are of extreme economic importance for North Rhine-Westphalia as a centre of industry and are of fundamental strategic significance.

An overview of NRW as an ICT centre:

- Over 140,000 employees work in 15,500 firms in the ICT sector in NRW, with a turnover of over 59 billion Euros.
- NRW is the home for Germany's largest telecommunication providers (Deutsche Telekom, T-Mobile, Vodafone D2 and E-Plus).
- 11 out of 50 largest ICT enterprises in Germany are based in NRW.
- NRW hosts German headquarters of numerous renowned international ICT companies.
- In the ICT sector in NRW, there are already several active regional and thematic networks, for example a very regionally focused IT Security network in the Bochum /

Gelsenkirchen region or the thematic Geoinformation Network with several regional centres in Bonn, Münster and the Ruhr region.

- NRW has the most concentrated university and research environment in the ICT sector in Germany. In 2007 there were 25,500 students in ICT-related faculties in NRW. Major university centres for the study of Informatics are Aachen, Bochum, Dortmund, Duisburg-Essen, Paderborn and the extra-mural University of Hagen.
- Because of the cross-sectional character of the ICT technologies, the ICT sector is closely cooperating with a large number of user sectors.
- NRW is one of the largest regional telecommunications markets in Western Europe, with a population of over 18 million and more than 723,000 firms.

ICT innovation policy in North Rhine-Westphalia: Cluster ICT.NRW

NRW has realized the importance of ICT for economic growth and social enhancement and fixed an ICT policy in 2008 as a part of the cluster policy. A professional Cluster Management, supported by fixed partners, focuses on the following challenges:

- ICT Profiling – bundling strengths in the Embedded Systems-sector to bring NRW to a leading position;
- Start-up & Grow – support for innovative ideas and products to get to the market;
- Cross-Innovation – identification and utilisation of potential synergies in other markets;
- Internationalization – support of incoming and outgoing ICT-companies;
- Communication – promotion of NRW-ICT-competencies.

The Ministry for Economic Affairs, Energy, Building, Housing and Transport is responsible for the implementation of the ICT innovation policy. The Ministry for Innovation, Science and Research as well as the State Chancellery are also involved.

General Innovation Policies

Cluster policy in North Rhine-Westphalia

The cluster policy of the state government of North Rhine-Westphalia supports the co-operation of firms, research facilities and the public bodies right the way along the added value chains in a total of 16 branches and fields of technology. These 16 clusters possess particularly significant potential for growth and are of great importance for the economic development of the state. Through the intensive collaboration of the players and a professional Cluster Management and with the help of competitions, special momentum for

growth and innovation is to be set in motion and structural adjustments are to be made in accordance with the varying demands of international, knowledge-based markets.

The following ministries are responsible for implementation of NRW cluster policy:

- Ministry for Economic Affairs, Energy, Building, Housing and Transport (MWEBWV);
- Ministry for Innovation, Science and Research (MIWF);
- Ministry for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection (MKULNV);
- Ministry for Health, Equalities, Care and Ageing (MGEPA);
- State Chancellery.

Lorraine (France)

Broadband availability and future development

Region Lorraine supports the development of digital infrastructure in order to give access to broadband and high-speed broadband to the territories, higher education and research centres. The past efforts enabled to evolve from accessibility logic to competitiveness between territories logic.

For this purpose Region Lorraine:

- Launches projects calls in the field of digital uses and services;
- Leads projects as direct contracting authority;
- Leads projects in partnership with other public authorities.

Target publics are companies, public authorities, higher education and research centres and any people, mainly those who meet difficulties to access to ICT.

Region Lorraine and French State steer a consultation body named "**Regional Consultation Authority about Digital Development of Territories**" (*Instance de Concertation Régionale sur l'Aménagement Numérique des Territoires, IRCANT*). In this body the main strategies linked to the broadband issues are decided. In the framework of this body, a "**Regional Coherence Strategy about Digital Development of Territories**" (*Stratégie de Cohérence Régionale sur l'Aménagement Numérique des Territoires, SCORANT*) will be elaborated in partnership with other concerned authorities and private operators. The strategy aims at reaching a mastered and balanced spreading of broadband on the territory. Indeed, only market actions do not answer the main issues of spatial planning, hence this public strategy is needed.

In parallel, Region Lorraine will commit with other authorities from Lorraine to the elaboration of a **Regional Strategy on Digital Uses and Services** mainly dedicated to competencies and

priorities of economic development, spatial planning, lifelong learning, health, tourism and transports.

In the framework of the **Projects Contract between French State and Region Lorraine** (*Contrat de Projets Etat-Région CPER 2007/2013*), there is an axis dedicated to ICT: **Great Project #7 "Widespread ICT access**" in a sum of about 70M€ (the state, region, departments and other public authorities).

The main objectives of the GP#7 are to:

- Reduce and open up so-called digitally white areas, particularly found in rural areas;
- Promote the deployment of optical fiber to the customer and in business parks, via projects calls or in partnership with other public authorities;
- Enable interconnection between Public Initiative Networks (*Réseaux d'Initiative Publique, RIP*) implemented by the departments and big cities.

The total amount dedicated to the projects intended to the public authorities is 11,1M€.

Lothaire network is a high-speed broadband network linking higher education and research centres in Lorraine. It is linked to Internet via RENATER network. The goal of Region Lorraine is to enable network operator, University of Lorraine to ensure a reliable functioning of the system. The amount dedicated to this action is 1M€. At the level of the Greater Region (trans-border area of cooperation between Lorraine, Wallonia, Luxembourg, Saarland and Rheinland-Pfalz), **this network is extended to Luxembourg and Wallonia** with the resources of IOT@ project cofinanced by Interreg IVA Greater Region and it is expected to extend to Germany soon.

Digitization of Patrimonial Collections Program in Lorraine aims to coordinate all the actions of digitization like conservation, enhancement, scientific exploitation and dissemination of written, architectural, movable heritage on whatever medium (paper, film, sound, etc) and whatever conservation place. All the documents must be made available to the public.

French State, the region and other local public authorities, mainly Departments and Cities, are involved in the implementation of ICT policies and its funding (Broadband availability).

Lorraine

ICT Adoption in SMEs

In Lorraine, there is neither strategy nor particular funding system for the SMEs to adopt ICT. However, companies benefit from spatial planning policy of Region Lorraine in the field of broadband availability. Strategies and programs described below improve ways of bringing technologies from research centres to SMEs.

ICT and ICT based Innovation

Lorraine's asset is strong research competence in ICT and mathematics, hence high potential for technologies to transfer. Lorraine Research in the Science of Information and Communication Technology and Mathematics represents 7.5% of national capacity in these areas. Our region is among the top five in France (OST-MESR report 2010, Sciences and Technics Observatory – Ministry for Higher Education and Research). **Lorraine's weaknesses** are lack of SMEs, SMEs' network and big firms in the field of ICT. Currently, market and economic opportunities are unfortunately not in Lorraine.

Regarding this unbalanced context, Region Lorraine would search to find the ways to improve its innovation strategy in order to enable best economic benefits on its territory from ICT-based innovation. That is what is expected through Bordwiis+ project.

ICT based Innovation Strategies of Inria

ICT represents one of the most important public research domains of the Lorraine region. The IAEM (ICT & Mathematics) research sector of Université de Lorraine represents nearly 25% of its faculty members, with about 600 researchers and major research centres like LORIA (computer science), CRAN (automation and control), or IECL (pure and applied mathematics). In addition Inria, the only French public research institution fully dedicated to ICT, bases one of its 8 research centres in Lorraine, where it conducts research in partnership with CNRS and Université de Lorraine through a number of project-teams in computer science and applied mathematics.

Our society relies increasingly on digital technologies to communicate, seek medical information, travel, or have fun. These often-invisible technologies simplify our tasks and enrich our daily lives, while also developing the economy.

Lorraine

At the interface of computer science and mathematics, from pure research to technological development and to industrial transfer, researchers at Inria, a public research institute, are inventing tomorrow's digital technologies. Inria's research is collaborative, which is evidenced by the diversity of the talent comprising its research teams, as well as in the many joint projects conducted with public and private research entities in France and abroad.

While competing with the leading international specialists in their field, Inria researchers and staff are also committed to sharing their knowledge with the widest possible audience.

Inria's research teams are small and work on projects with strong societal or economic implications. In each research centre, departments are dedicated to development and support for research. Whereas the national character of the institute translates into the definition of strategic national schemes, Inria is often performing its research in joint teams with local universities, when this national strategy is in conformance with the university's own strategy and forces.

The Inria Nancy-Grand Est research centre (mostly based in Nancy) is also involved in several projects of cooperation in the field of ICT in the Greater Region (trans-border area of cooperation between Lorraine, Wallonia, Luxembourg, Saarland and Rheinland-Pfalz): Allegro, IOT@ with a number of close collaborations with research tems in Saarbrücken, at Universität des Saarlandes and at Max Planck Institut für Informatik, University of Luxembourg. Inria has a long tradition of working with the industrial and economic world, for which it is a privileged partner in digital technologies. Special efforts are focused on SMEs and on emergence of young start-up companies (more than 100 since 1984). As a national institute, Inria also intends to continue being a key player in European research policies and contribute to constructing the European research area.

Public authorities involved

In France, regions are leading players in territorial economic development and competent to define the regional strategy in the field of the innovation. In this context, French State (mainly Ministries of Economy and Higher Education and Research) and regions are the main actors responsible for the questions of innovation. Nevertheless, several public and private structures contribute to the funding of innovation projects according to their priorities: local public authorities, research centres, universities, industry and commerce chambers, etc.

Lorraine

General Innovation Policies

Regional innovation policies in the field of ICT are transverse to all our strategies. Several levels of interconnected regional strategies with a transverse support to ICT based innovation projects (research projects or collaborative projects).

12 priority sectors (strategic support to all the complementary levels of a key-sector in Lorraine in order to improve the impact of the regional policy) are set in the framework of the regional strategy: Forest-wood-furniture aerospace; automobile; chemistry; Agriculture and Agri-Food; Materials and mechanical; Green building and eco-renovation, natural resources and sustainable development; Health and biotechnologies; Tourism-attraction; Art-luxury-creations; Social economy; Emerging sectors: economy and development of the XXI century. ICT is considered as a key-sector since it is included in the sector/chain for the future. More particularly, ICT are strongly linked to the "Health" sector/chain e.g. Smart Room, robotics and automation. Informatics security is also a strong competency in Lorraine.

Innovation Regional Strategy (SRI): ICT is mentioned as key-competency in Lorraine but only at the research level with a strong potential of technologies to transfer. The challenge is to bring theses competencies and technologies towards the Market to benefit regional development.

Competitiveness poles: Materalia (Materials), Fibers (Fibers, Wood, Forest) and Hydreos (Water quality and management). ICT is transverse to the projects developed by these innovation poles.

Greater Region (trans-border area of cooperation between Lorraine, Wallonia, Luxembourg, Saarland and Rheinland-Pfalz) includes several projects of cooperation in the field of ICT. Furthermore, Region Lorraine is currently President of Greater Region (until 2013) and leads a cooperation group on Higher Education and Research gathering all the public authorities from the Greater Region relevant for these topics.

Projects Contract between French State and Region Lorraine (*Contrat de Projets Etat-Région CPER 2007/2013*): The Regional Council funds digital technologies which are a key challenge for innovation and economic development. In the framework of CPER, we previously saw the Great Project#7 dedicated to broadband availability (part#1). Another Great Project is dedicated to research and innovation system:

Lorraine

Great Project #1: "Foster the international development of the innovation, research and higher education system in Lorraine". In the framework of this GP#1: 5 Scientific and Technological Research Poles (PRST), including 1 PRST dedicated to ICT (**Modelling, Information and Digital Systems, PRST-MISN**). 6 structuring projects are funded with 7M€ during 7 years (2007-2013):

- Analysis, Optimization and Control (AOC);
- Experimentations and Large Scale distributed computing (EDGE);
- Situated Computing (IS);
- Safety and Security System (SSS);
- Automatic Language Processing and Knowledge (TALC);
- Bio molecules Modelling and their Interactions (MBI).

This program is also supported by CNRS, INRIA and University of Lorraine.

The teams belonging to this cluster involve more 500 permanent researchers and doctoral students on many different sites in Lorraine. Laboratories and research teams in this sector, which are grouped in the PRST MISN, pledged long-standing modelling collaborations with partners in other disciplines (physicists, chemists, biologists, architects, linguists, doctors).

The overall objective of PRST MISN is to boost the development of disciplines, to promote consistency within the ICT research Lorraine system and strengthen these multidisciplinary relationships. The PRST MISN follows the PRST IL „Software Intelligence" of the previous CPER 2000/2006. It heavily relies on results obtained in the previous period, continuing to build strong themes of ICT sector in Lorraine.

Since 2009, Region Lorraine launches targeted collaborative projects calls with consequent amounts (several millions Euros). These calls are managed by the **Economic Mobilization Agency** (AME) of the Region Lorraine. Since 2009, 4 main calls have been launched and 3 have been dedicated to ICT (not directly but linked with other topics like Health, Life science or sustainable development). An example can be mentioned here: RELIEF (Large-scale Computerized Lexical Resource Scope dedicated to the French language - *Ressource Lexicale Informatisée d'Envergure sur le Français*) project involving CNRS/University of Lorraine and a SME. This project deals with the informatics enhancement of French language. The regional funding is 1,9M€ on 3,8M€ of total budget. ERDF is also mobilized within the budget plan.

Lorraine

Since 2006, Region Lorraine and OSE, a private structure of French State aim to fund innovation initiatives of SMEs, support innovation in SMEs with the **Innovation Regional Funds in Lorraine** (*Fonds Régional d'Innovation en Lorrain, FRIL*). Through refundable advances and subsidies, FRIL supports innovation projects of SMEs as well as innovative companies' creation. Since 2006, 48M€ have been dedicated to these types of innovation projects, among them several ICT projects.

University of Lorraine in partnership with Region Lorraine and Oséo (and also in collaboration with Inria, INSERM, CRNS, INRA and CHU) propose funding aiming to support valorisation projects leaded by researchers. This program is called "**Maturation funds**" (*Fonds de maturation*) and works by projects calls. Since 2006, 70 projects have been funding through this funds with 2.8m€.

At last, the French State has set up in 2009 a huge funding program mainly dedicated to the large structuring projects of higher education, research and innovation but also of sustainable development and digitals. This program is called "**Investments for the future**" and proposes a global envelop of 35Md€. In the field of ICT, Lorraine has recently been sectioned for an equipment project (Equipex ORTOLANG, Open Resources and TOols for LANguage, 2.6m€) concerning the ICT appliquéd to the linguistic) and is involved as leader in the national project ISTEX (University- of Lorraine and CNRS / 67m€ / digitalization of scientific resources).

Public authorities involved

Considering the main regional innovation strategies, the two competent actors are the Regions and the French State. Both them are involved in the definition process and the implementation of CPER and SRI. French State also launches projects calls in the framework of the program titled "Investment for the future". Region Lorraine launches its own projects calls in the framework of its regional policy (the 12 sectors/chains, EMA).

Furthermore, all the public authorities can fund a particular innovation project if they consider that it is relevant for its own policy.

Asturias (Spain)

Broadband availability and future development

Strategy, objectives and measures

Broadly speaking, the ICT sector has undergone huge growth in Asturias in recent years. Asturias is characterized by a high penetration of broadband in households and also companies, and it is also the first Spanish region in terms of broadband access through cable network. Asturias Government promotes the evolution of Asturias to an Information-based Society, in convergence with Europe, by strategic policies as the eAsturias strategy. Renewed yearly since 2007, e-Asturias 2012 (www.e-asturias.es) is composed by strategic lines such as:

- Strategic line #2: Promoting the modernization and deployment of telecommunications infrastructure in the region;
- Strategic line #3: Promoting the adoption of ICT and innovative practices in companies, mainly in SMEs;
- Strategic line #4: Promoting widespread use among the citizens of the electronic services offered by the Asturian Administration.

In the field of infrastructures[1] (Strategic line #2), e-Asturias 2012 defines among others the following actions and measures (2008-2012):

- Finishing the digital TV deployment at regional level;
- Spreading services based on mobile and/or broadband connection (citizens and companies);

[1] As part of the e-Asturias 2012 strategy, actions regarding infrastructure are defined in the "Estrategia de actuación para el desarrollo de las Infraestructuras de Telecomunicaciones en la comunidad autónoma del Principado de Asturias".

- Spreading broadband connection;
- Spreading the deployment and coverage of advanced regional telecommunication networks.

The deployment of next-generation networks (NGN) based on Internet technologies and architectural evolutions in telecommunication core and access networks will be one of the main goals over the next years. It is generally accepted that next-generation access networks (NGA) include fiber-rich infrastructure and technologies such as fiber-to-the-home (FTTH) and upgraded cable TV networks. In Asturias there is a specific measure for spreading FTTH called "Spreading optic-fiber networks to the household (FTTH) 2008-2012", financed by the regional ministry of Public Administrations and supported by GIT[2] .

One of the most important infrastructures in Asturias is the regional Network (*Asturcon - Red Astur de Comunicaciones Ópticas Neutras*), in operation since April 2007. This Network is a fiber-optic-access network to home (FTTH), with GPON technology that, for its characteristics and performance, is at present among the most advanced in Europe and it is the pioneer of being simultaneously public, neutral and of high capacity. The characteristics of the Network Asturcon allow the operator clients to offer nearly all imaginable services. The most common are the ones known as "Triple Play". Television and telephony can be offered both in their conventional or IP version. Depending on the operator[3] they select, the Network users have at their disposal:

- Cable TV, or Conventional TV
- IP Television, or TV "a la carte" (under request)
- Conventional phone, or IP phone (Internet)
- High-speed Internet access.

Additional data:
http://datos.fundacionctic.org/inversionestic
http://datos.fundacionctic.org/asturtic

[2] GIT (www.gitpa.es) is short for "Gestión de Infraestructuras Públicas de Telecomunicaciones del Principado de Asturias S.A..", a public company which is 100% owned by the Principality of Asturias. The most important infrastructure managed by the GIT is the regional Network (Red Astur de Comunicaciones Ópticas Neutras), in operation since April 2007.

[3] The Principality of Asturias creates the "Asturcon" network; GIT manages it, and the different suppliers offer their services to the general public

Public entities and regional ministries involved

- Regional Ministry of Public Administration;
- Regional Ministry of Presidency;
- Regional Ministry of Treasury and Public Sector;
- CAST (*Consorcio Asturiano de Servicios Tecnológicos, organismo para la coordinación con las Administraciones locales*);
- GIT (*Gestión de Infraestructuras Públicas de Telecomunicaciones del Principado de Asturias S.A*).

ICT Adoption in SMEs

Strategy, objectives and measures

As mentioned before, the e-Asturias 2012 strategy defines the strategic line #3 "Promoting the adoption of ICT and innovative practices in companies of Asturias, mainly in SMEs" as one of the key areas for 2008-2012. In this sense, there is a specific program called "digital SMEs" (http://www.e-asturias.es/easturias/contenidos/es/lineas/pyme_digital) devoted to spreading the ICT adoption mainly among SMEs.

Some specific measures:

- Measure #1: Support to the digitalization of the regional companies (in terms of awareness, assessment, training and e-certification processes);
- Measure #2: Promotion of Internet (business scope) among self-employed and entrepreneurial;
- Measure #3: Incentives for investment (equipment, connection and Internet presence) among SMEs.

Some examples of specific programs developed under the umbrella of the before- mentioned measures:

- Program "InnoEmpresas" (2007-2013);
- Network of "*Centros de Servicios Avanzados de Tecnologías*" (SAT 2000-2012).

Public entities and regional ministries involved

- National Ministry of Industry, Tourism and Commerce;
- Regional Ministry of Economy and Employment;

- Institute for the Economic Development of Asturias (IDEPA);
- Public "*Centros de Empresa*" of Asturias.

ICT and ICT based Innovation

Strategy, objectives and measures

The definition of a strategy for boosting the competitiveness of the ICT sector in Asturias is a key element at regional level due to the horizontality of the Information and Communication technologies. In this sense, as part of the e-Asturias 2012 strategy, some of the main goals considered as part of that strategy are:

- Promoting widespread use among the citizens of the electronic services offered at regional level by the Public Administration;
- Strengthening the ICT sector in Asturias (ensure the consolidation and expansion of the network of business relationships forged in recent years);
- Advancing technological development in free software, in collaboration with the ICT sector in Asturias (progress in strengthening the development environment of the Principality of Asturias (FWPA) and contributing to the competitiveness of the ICT sector in Asturias);
- Integrating innovative digital content „made in Asturias" to the Internet and media and communication;
- Promoting local e-Government and its approach to citizenship in the municipalities of Asturias;
- Encouraging the adoption of ICT in Public Health Services and Education.

Some specific measures:

- Increasing of high-qualified human resources to increase regional competitiveness and employment;
- Contributing to technology transfer among RTD entities and business agents;
- Boosting the growth of technology enterprises;
- Encouraging the entrepreneurial;
- Promoting the internationalization;
- Boosting the specialization among ICT companies.

Regional ministries involved

- Regional Ministry of the Presidency;
- Regional Ministry of Economy and Employment.

General Innovation Policies

Regarding innovation, the regional strategy is defined by the Plan for Science, Technology and Innovation (PCTI) of the Principality of Asturias which, in a nutshell, reflects the desire to develop all those actions that enhance scientific research, technological development and innovative activity in Asturias. A new plan is under definition at the moment of writing.

Specialization has been part of the economy and innovation policies of the Government of the Principality of Asturias during the last decades, especially when talking about innovation ecosystem. Innovation ecosystem in Asturias is composed by several institutions, RTD centres and innovation offices with delimited competences and complementary fields of expertise such as Materials, Design & Industrial Production, Energy, Food and Agriculture, Bio-Health or ICT.

The promotion and support to companies networking through their organization into clusters is a relevant approach to take into account at regional level. ICT Cluster named Innovative Knowledge Business Association of Asturias was founded in October 2009 with the aim of promoting technological development, innovation, knowledge management and applied research in the field of knowledge society.

In addition, Technology Centres are considered by the regional Government of the Principality of Asturias as one of the main actors devoted to drive forces for boosting the competitiveness of the companies. In this way, the regional Network of Technology Centres of Asturias is a key component of the Asturias' innovation ecosystem. CTIC is the regional Technology Centre for the ICT sector in Asturias.

Regional ministries involved

- Regional Ministry of Treasury and Public Administration;
- Regional Ministry of Health;
- Regional Ministry of Education and Universities;
- Regional Ministry of Economy and Employment.

Romania

There have been dynamic and positive changes towards transparent ICT policy-making in Romania in recent years. However, there remains work to be done in key areas. While government and business are actively involved in shaping and developing ICT policy, civil society is poorly represented. Perhaps as a result, a technocratic rather than a developmental discourse prevails. For example, gender and open source issues are totally invisible in official public discourse.

While governmental ICT players' roles and responsibilities were legally redefined and clarified throughout 2007 - 2010 (in line with the EU's directives and requirements), administrative procedures and mechanisms are unclear to the public. Policies and procedures that are clearly defined should theoretically be publicly available on government websites. However, this is not always the case. For instance, the MCTI website has a number of broken links, making key documents unavailable, such as the national strategy on the information society. This amounts to a disempowerment of citizens.

As far as internet governance goes, the administration and management of the top-level domain .ro is also not transparent (several attempts by the authors to clarify the issue failed). This remains a serious concern.

Future ICT policy priorities for Romania should include promoting active civil society involvement and bottom-up consultation in the ICT policy process, and stimulating public awareness on ICT policy issues.

Broadband availability and future development

In Romania, broadband internet has been available since 2000, through coaxial cable, first from Kappa (now defunct) and currently from RCS&RDS and UPC-Astral. Romania's broadband

market has grown rapidly due to strong competition. Competition is predominantly infrastructure-based. Competing broadband platforms include widely accessible cable TV, micro LANs, ADSL, wireless and fiber.

Romania's fixed-line telecoms market is evolving under the weight of competition and technological change. Implementation of EU Directives has opened the telecoms market to competition and implemented a regulatory framework designed to foster effective competition.

For business use, services are usually provided through fiber optics or radio. Companies providing such services are providing very flexible and negotiable plans also based on the Metropolitan/International distinction. Usually prices and bandwidths are fully negotiable, with the micro-ISPs discussed above being influential resellers. There is very strong competition, with no peering between many such companies (again requiring a lot of traffic to be routed through international routes) and not even access to another's fiber-optics infrastructure (leading to the existence, in some cases, of over 25 fiber optics cables on the same street, hanging from the same pole). As such many companies have two separate providers for basically the same services.

At regional level, ICT importance to economic development and competitiveness has been also confirmed. The ICT leads to new models of work organisation as well as to faster spreading and using information. The SE Regional Development Agency of Romania elaborated the Regional Innovation Strategy in 2008 covering a period till 2015. ICT sector is a priority sector within the Strategy and has turned into a Priority Axis.

Broadband is considered a technology trend expected to drive productivity gains and output growth in economy. Broadband is expected to contribute significantly to ICT gains because it is a basic infrastructure and enables the delivery of innovative services and applications.

The main contribution of the ICT sector to economic growth is mainly sustained through the companies' uptake. The ICT usage stimulates extensive and intensive growth for goods and services production:

- Extensive growth – ICT provides, for the Romanian companies, the opportunity to access new regional and global markets and to promote and commercialize goods and services inland by electronic means.

- An intensive development is also due to the decrease of production, administration and marketing costs, deriving from ICT use, which can determine a significant increase of productivity;
- Development of e-business capacity, application of e-business, ICT skills and the use of ICT in business processes by SME in order to have access to international information sources are also required for services of high added-value.

Measures targeted:

1. Introduction of ICT in P.A.: e-government and e-procurement;
2. Improvement of access to information on a regional scale, particularly in education and R&D institutions;
3. Support for the up-grading and completion of ICT-networks in the region.

ICT Adoption in SMEs

ICT sector was extensively analysed and developed into a priority axis in the Regional Innovation Strategy of the SE Region. Particular emphasis on broadband is considered, since high-speed internet connections are seen as the enabling source of the benefits of convergence, a technology trend expected to drive productivity gains and output growth in economy.

New ways of running marketing and business with customers and suppliers within the e-business are not widely used. At the same time, the e-learning creates for SME a possibility to gain knowledge in a flexible way tailored to conditions. ICT solutions can be very useful in a management process and production optimisation. Implementation of the solutions often requires from company employees the ability to adapt to it and to have an additional training.

The main contribution of the ICT sector to economic growth is mainly sustained through the companies' uptake. The ICT usage stimulates extensive and intensive growth for goods and services production. Concerning the extensive growth, ICT provides, for the Romanian companies, the opportunity to access new regional and global markets and to promote and commercialize goods and services inland by electronic means. An intensive development is also due to the decrease of production, administration and marketing costs, deriving from ICT use, which can determine a significant increase of productivity.

Romania

E-economy provides benefits for a wide range of activities that are specific to the business environment. At companies' level, the ICT applications are essential for the corporation internal and external communication, as well as a more efficient management of resources and customers. Development of e-business capacity, application of e-business, ICT skills and the use of ICT in business processes by SME in order to have access to international information sources are also required for services of high added-value.

The broadband connections extension and data security increase, that are compulsory conditions for the knowledge-based economy, are also to be supported. The interventions aiming to support the broadband infrastructure development will address the competitiveness consolidation as a target for higher potential areas.

Under this measure, it should be planned to support SMEs in the purchase of specific ICT infrastructure and Internet services, including basic terminal equipment, Internet connection, technical assistance services, the development of simple commercial web pages, their maintenance and virtual hosting. Also the server capacities in the regions need to be upgraded, through the promotion of such dedicated services.

On the other hand, SMEs already possessing at least an elementary ICT infrastructure will be supported to adopt ICT applications and solutions, to develop an e-business culture. The support is directed towards ICT applications and their interoperability, adoption of integrated solutions for companies leading to long term cost-cutting, thus facilitating the access to internal and international market and sustaining more efficient management processes, observing at the same time the increased security of the electronic networks and the adoption of anti-fraud solutions in order to develop a secure and dynamic E-Business sector. These applications include also the development of different data platforms, not only web-based, but also through mobile telephone networks.

Complementary to these actions, SMEs will receive specialized training support provided by ICT specialists.

ICT sector, which has one of the highest growth rates in the country with about 15 percent per year, is also a priority sector for the development of industrial parks.

ICT and ICT based Innovation

ICT sector development

Despite the considerable progress scored by Romania in developing ICT in recent years, the information technology infrastructure and use still remains far from the level of older EU member states.

IT investments are required in order to facilitate the development of a true knowledge-based society, especially for spreading of IT equipment, services and software applications. It is extremely important to increase investments in the ICT field and to reduce the gaps between the actual expenditure level and the desired development level. This has a negative impact on national competitiveness, as computer usage and Internet access are important factors for economic development.

Those significant infrastructure gaps are remediable only through major investments, both from private companies and from public institutions:

- Taking into consideration that the correlation between education and broadband is strong, the main direction will be to stimulate demand, in the sense of supporting development of new projects which will complete the achievements of ongoing major projects (e.g. Knowledge Based Economy and Information Educational System);
- Therefore, the structural funds intervention will support the implementation of e-learning applications for a more efficient qualification system, generating a better-trained work force, more flexible and more adapted to the market requirements.

Actions:

1. Support to e-learning applications in R&D institutions for a more efficient qualification system;
2. Stimulate introduction and use of ICT-networks in education and research centres;
3. Encourage use of broadband connections by enterprises.

General Innovation Policies

Knowledge transfer and support to innovation poles and clusters policy area addresses another important weakness of the Romanian RDI system, i.e. the poor links between the

public R&D system concentrated primarily in national R&D institutes and institutes of the Romanian Academy, and the business sector, which has a poor R&D capacity and also a poor absorptive capacity.

This policy area also aims to strengthen the research activities in universities and the commercialisation of academic research, which is poorly developed in Romania.

Universities have weak linkages with the business sector and are essentially education providers, as their research activities account for only a small share of activities. Concepts like the "entrepreneurial university" or "university-industry consortia" have only recently emerged in the public debate and some support measures have been adopted, but their impact is still minor.

Direct or indirect support for knowledge and technology transfer:

- Direct support: aid scheme for utilising technology-related services or for implementing technology transfer projects, notably environmentally friendly technologies and ITC;
- Indirect support: delivered through funding of infrastructure and services of technology parks, Innovation centres university liaison and transfer offices, etc.

Direct or indirect support for creation of poles (involving public and non-profit organisations as well as enterprises) and clusters of companies:

- Direct support: funding for enterprise level cluster activities etc;
- Indirect support through funding for regrouping R&D infrastructure in poles, infrastructure for clusters etc.

In the SE Region of Romania Software Park (cluster) in Galati has links in Europe and USA.

REGIONE TOSCANA

Tuscany (Italy)

Broadband availability and future development

As far as Tuscany inhabitants, the diffusion of Internet among families increased from 34.4% in 2002 to 48.8% in 2009, in line with the growth of other regions in Italy. Among the uses of Internet the most advanced one is e-commerce especially addressed to vacation and tourism (43.7%), books and magazines (26.6%), clothing, sporting goods and electronic equipment that are around to 20%.

The data relating to local or public authorities are over the average for the Italian ICT infrastructures: e.g. 88, 5% of the Tuscan towns have a broadband internet connection against 74.7% of Italian municipalities, 74.2% of the municipalities adopting open-source solutions (Italy: 48.1%).

Connectivity in Tuscany is also fostered by the Tuscany Region IT Network, that is a network of public entities, municipalities, hospitals and educational organizations, operating through the Connectivity Public System, the network that links together all Italian public administrations, and acting thought Organizational Model of relationships based on the concept of shared goals, cooperation and partnership, able to produce and sustain innovation processes.

ICT Adoption in SMEs

The Tuscan situation shows that companies with more than 10 employees have adequate levels of infrastructures (PC: 95.3%; Internet: 92.4%; broadband: 82.3%), but also indicates that

small businesses, such as part of handicraft, despite the progress recently done, are still suffering a certain delay (PC: 51.1%; Internet: 44.2%; broadband: 39.2%) that threatens to become a form of digital inequality.

As regards the use of the Internet among companies, most of them are interested in accessing to banking and financial services, market watching, searching for market partnership information. Rather other uses of internet may have a larger application, such as interactive and complex services, cloud computing, co-designed processes, or even the acquisition of goods and services in digital format, the on-line post-sales, e-learning, forms of integration of information systems, internal and external the company and especially e-commerce.

The company's website is still not widespread in Tuscany or anyway very often don't provide interactive services (55.7%): the idea seems to persist the website as a „showcase" and not as a tool with which to offer more services and opportunities for interact with users.

ICT and ICT based Innovation

Tuscany has a long and well-established tradition in the ICT field. The region hosts universities and leading research centres in Italy and Europe.

The main Italian companies in this sector had some of the major multinationals have invested in Tuscany by launching collaborative project with universities and by financing several important research projects in the fields of informatics, satellite systems, radar and antennas, electronics, second generation of RFID systems, applications for cultural heritage management, video-surveillance and robotics, among many others.

The strongly research-oriented environment, at both the basic and applied level, is not only a fundamental resource for the numerous major Italian and foreign companies that collaborate with the universities of Tuscany, but also contributed to generate a large number of start-ups and spin-offs focused on the development of extremely innovative products which are often pioneers on the technological frontier.

The excellence segments of the ICT in Tuscany:

- Artificial vision, video-surveillance, digital libraries and natural interaction;
- Telecommunications, microwave and wireless systems and applications;
- Electronics and microelectronics;

- Satellite systems and applications;
- Radar and antennas systems and components, radar imaging;
- Applications for domotics, robotics virtual reality, haptic interfaces e-health, bio-engineering and biomedicine;
- Application for space, nautical, aeronautical and defence sectors;
- Technologies, systems and applications for cultural heritage management;
- Optical fibers, photonic and laser communication;
- Remote sensing and monitoring;
- Informatics and software development;
- Security-related technologies, systems and applications;
- Bioinformatics.

The main companies present or carrying out Research activity on ICT in Tuscany are Yahoo!, Microsoft, Alcatel-Lucent, Thales, Marconi- Ericsson, FinMeccanica, EDS, Aspen Technologies, ST Microelectronics, SELEX Galileo, Hitachi, IBM, Nokia, Siemens, Mitsuba, SELEX Communications, Power-One.

General Innovation Policies

As well known, ICT are one of the Key and Enabling Technologies, affecting deeply many levels of the everyday life. For this reason at regional level ICT are addressed by several policies, integrated in the Regional Program for Information Society Knowledge.

In the last planning period (2007-2011) the main axes were:

- Enabling infrastructure, in two distinct types of „technological“ and „knowledge“;
- E-services, policies for the provision of community services,
- E-communities, political access and participation;
- E-competitiveness policies for sustainable economic development.

In the current planning period the macro-objectives of the former one will be fostered again with particular attention to:

- Policies for industry, handicrafts, tourism, trade;
- Policies for education, training and employment;
- Policies for culture;

- Policies for infrastructures and mobility;
- Health policies;
- Inclusion policies.

As far as regional innovation policies and ICT, the main initiatives are connected to industrial research aid to companies, the functioning support of ICT innovation pole, the creation and sustain of R&D labs facilities, the promotion of agglomeration and clustering processes both for Knowledge Intensive Services diffusion and R&D activities.

Finally, the ICT Technological District is the main attempt, in terms of Regional policies, to maximize cooperation between Companies and Research, addressing advanced R&D initiatives, and foster innovation spill over at regional level.

IFKA
IPARFEJLESZTÉSI KÖZALAPÍTVÁNY

Central Hungary

Broadband availability and future development

Currently Central Hungary is the most developed region in Hungary representing 49.2 % of Hungary's total GDP in (2009) which amount to 104.1% of EU27 average and more than 160 % of the national average. The number of registered companies was 591 232 in 2010 that is roughly 34% of total Hungarian registered companies. Expressing considerable R&D capacity the regional GERD amounts to nearly 140 billion HUF in 2010 and the region encompasses the vast majority of research institutions, multinationals' R&D labs, science parks. ICT plays a crucial role in Hungary as it enjoys a remarkable tradition in Hungary – many Hungarian scientists and engineers have made their mark on information technology and computer programming.

Findings of the European Commission's ICT Country Profiles show that ICT represents 6% of the total Hungarian economy and is one of its most dynamic sectors. Hungary is one of the EU27 countries with the highest share regarding graduates obtained a degree in computing between 2006 and 2009. Similarly 21% of persons are employed with ICT specialist skills are located in the region which is one of the highest rates in all Europe (source: European Commission, Brussels, 17.5.2010, SEC (2010) 627, ICT Country Profiles). ICT represents 17% of total Hungarian GDP & provides 25% of GDP growth in which Central Hungary has notable share.

Key numbers at regional level:

- Households with internet access at home (%, 2011): 75
- Households with broadband internet access (%, 2011):69
- Individuals regularly using the internet (%, 2011): 76
- Individuals who have never used the internet (%, 2011): 18
- Individuals who ordered goods / services over the internet for private use (%, 2011): 26

Central Hungary

Key numbers at national level:

- Percentage of the ICT sector to GDP (%, 2008): 5.91
- Percentage of the ICT personnel on total employment (%, 2008):3.52
- Enterprises with fixed broadband access (%, 2011):84
- E-government usage by enterprises (%, 2009):68
- High-tech exports (%, 2006): 20.325
- Turnover from innovation (%, 2008):16.4
- Broadband penetration rate (%, 2010):19.7

ICT and ICT based Innovation

Influenced by international mainstreams of the last decades Hungary has recognized the necessity of focusing on new dimensions of regional competitiveness, namely on regional development questions of information society, as well as on the elaboration of regional strategies based on information and communication technologies (ICT). After national level strategies (MITS), namely the National Information Society Strategy in 2001 and the Hungarian Information Society Strategy in 2003, regional the Regional Information Society Strategies (RITS) have been formulated in all regions of the country pointing out several development opportunities, directions and proposals. Since 2004 and 2005, when Regional Information Strategies were created, it was entitled to expect wider range of results of information society development in the Hungarian regions. Real experiences of development policy are, however, not reassuring enough. Aims and thoughts formulated in regional strategies has been achieved and accomplished slightly or just indirectly. Most experts agree that the Central Hungarian Regional Information Society strategy, together with the 6 other regional information society strategies, was a bookshelf document only.

The reasons behind this tendency are manifold and mainly affecting the Regional Information Society Strategy for the Central Hungarian Region to a great extent:

1. Although the ICT industry is a fast-growing and rapidly changing sector where innovation plays crucial role the Hungarian Regional Information Society Strategies have neither direct link to innovation nor to SMEs.
2. The timeframe of the strategies are 10-15 years.
3. There were no agencies or institutions with dedicated authorization power appointed to the implementation and evaluation of the strategic objective realization.

4. The Regional Information Society Strategy for the Central-Hungary Region had inadequate funding.
5. The Central Hungarian Regional Information Society Strategy has been developed by the ProRegio – Central Hungarian Regional Development Agency and has been sponsored by the Central Hungarian Regional Development Council and the Ministry of Informatics and Broadcasting. Later the Ministry of Informatics and Broadcasting has been re-organized and discontinued resulting in the cut of funds.
6. The Central Hungarian Regional Information Society Strategy has no focus on ICT multinational corporations, SMEs, and intermediary organizations. The strategy is placing the government and local sphere at the heart of the concept. There is no initiative to bridge industry, policy-making and education in the field of regional background conditions, incentives, tax reductions, tools or HR development via common collaborations.
7. The development of e-governance is the priority area.

The Regional Information Society Strategy for the Central Hungarian Region was centred on 3 specific objectives and 5 priority areas. The priority areas are including the 1) increasing of citizens' „IT-comfortability", 2) development of the technical background, infrastructure, 3) introduction of e-administration, 4) development of network cooperation, rationalization of resources, 5) improvement of IT-supply in the region & increasing awareness about IT.

In practice, the Central Hungarian Regional Information Society Strategy is the only one among the Hungarian regional strategies that has targeted multi-disciplinary approach via putting the reduction of inequalities and the society-centred development in the foreground. Additionally, the strategy is taking steps to reduce the digital divide and digital illiteracy at regional level while achieving partly success by enhancing data access and open sources, data mining and storage practices.

The electronization of public services action line is one of the most decisive one as currently in Hungary medical health records are completely electronic and most of the local authorities are accessible through e-governance entry points (client gates). The planning of the strategy, namely the Hungarian way of national and regional information society development was of course not without preliminaries: it followed basically the EU trends. The European strategic documents, such as the "White Book" in 1993, the "Bangemann-report" in 1994, "eEurope" in

1999, "i2010" in 2005 etc. had a significant influence on Hungary's information development policy.

General Innovation Policies

Central Hungary Region's Regional Innovation Strategy has been prepared in 2005 in a cooperation of the CHIC CENTRAL HUNGARY INNOVATION CENTRE and the ProRegio Central Hungary Regional Development Agency in the framework of Twin Region's Innovation Strategy – Innovation Axis project. In 2001 Central Transdanubia and Central Hungary Region's application – in partnership with the Italian Umbria and the German Brandenburg regions – have been awarded the grant of the 5th Research and Development and Demonstration Framework Programme for elaboration of Regional Innovation Strategy.

The goal of elaboration of the Regional Innovation Strategy – prepared on the basis of EU criteria and methodology – was to enhance the competitiveness and innovativeness of small- and medium-sized enterprises, finally to support the enterprises successful operation in the EU market. In practical terms this means, that productive sector of economy was expected to shift from "assembling" to Research and Development, to higher level services and to knowledge-based economy. This has prepared ground for the creation of quality workplaces possible, and serves as the basis of innovation-purposed utilization of Structural Funds. The region has demonstrated long-term commitment towards the development of SME innovation capacities and possibilities via effective utilization of presumably expanding financial resources, with which it can contribute to the preservation and enhancement of competitiveness of enterprises.

In practice, the strategy has placed the Central Hungary Region at the innovation-driven society with an integrator role to support the region to become an important constantly developing region of the Hungarian Information society and the European Union. Significant efforts have been assigned to the development and creation of the socially aware Hungarian innovation model fostering dynamic development of small- and medium-sized enterprises Central Hungary Region becomes a substantial European centre of product and technology innovation.

Action lines cover three main intervention areas such as 1) Enhancement of SME's working conditions, 2) Promotion of product and technology development, 3) Raising the level of innovative culture. Priority area number 1 was addressed to ensure the continuity of

entrepreneurial activity at regional level. Priority area number 2 was dedicated to foster the competitiveness of regional SMEs in increasing the number of marketable products and services. Last but not least priority area number 3 was devoted to attract attention to innovation with the help of communication and to generate new ideas with the potential to become innovative start-ups.

Priorities areas described above have been supplemented by three pilot projects to better facilitate dialogues and joint thinking among relevant regional actors. These pilots are the followings: a) Creation of product development consortia to support SME's product development; b) Development of connection systems; c) Creation of a seed capital fund. As evidence shows interventions are still relevant and contribute to the overall functioning of the regional innovation system in its complexity. The seed capital funding mechanisms is one of the most successful and well-defined element of the overall strategy.

However, the strategy has not been renewed since its development, signs are underpinning that most relevant strategic focuses are still relevant, although the regional innovation strategy is rather a framework condition for regional actors to work than real tool.

CLUSTER 55°
ICT ØRESUND

Skåne (Sweden)

Broadband availability and future development

Building ICT infrastructure has since the 1990s been a prioritized part of both national and regional policies in Sweden. This has resulted in a well-developed infrastructure and Sweden now has one of the highest rates of Internet penetration, mobile phone penetration and e-business implementation in Europe together with the one of the highest ICT spending level per capita in the world.

IT is used extensively in Sweden and 98% has access to internet at home, while more than 85% has access to broadband – min. 128 kbps. Wireless broadband and fixed networks are available in the entire Skåne Region, while the more rural areas of Sweden only are covered with about 85%. Also fiber optics is available in the region, where approximately 30% of all residents have access.

Technology shifts

Over the last couple of years Sweden has witnessed a technology shift. The number of broadband subscriptions based on fiber and mobile technology is continuing to grow, while the share of DSL is falling. This is partly due to an increasing demand for higher connection speeds. On a national level more than 70% of all broadband subscriptions have at least a 10 mbps connection while more than 10% has a 100 mbps connection.

Another shift in technology is also expected in mobile telephony. In 2010/2011 LTE 4G was made available in the Skåne Region, and thus connection speeds up to 100 mbps are now widely available thanks to Telia, the first in the world to launch this mobile network.

Future Strategy

Developing the ICT infrastructure continues to be a vital part of Sweden's innovation and growth strategy. In 2008 the Swedish Government presented an ambitious 2020 strategy requiring extensive expansion and upgrading of the existing infrastructure. The goal is that in 2020 of 90% all households and businesses have access to 100 mbps broadband connection.

In the Skåne Region this goal has been translated into 3 main targets

- At least 95 of all households and businesses have access to a broadband connection with at least 100 mbps in 2020;
- 100% of all schools and public buildings will have access to 100 mbps in 2020;
- Every expansion of the broadband shall be done through open and competitive neutral networks.

While the mobile networks may seem as a viable alternative they cannot replace fiber optics, which gives a range of possible new services.

Public authorities involved

The Ministry of Enterprise, Energy and Communications is responsible for the development of the IT-strategy in Sweden, while agencies like the Swedish Agency for Economic and Regional Growth – Tillväxtverket, the Regions are responsible for the implementation. Also involved are the municipalities and The Swedish Post and Telecom Authority.

ICT Adoption in SMEs

More than 90% of all businesses uses the internet and have a broadband connection. In order to enhance the use of ICT in SMEs several national and regional projects have been launched. Efficient use of IT and the internet is seen as means for the companies to cope with the challenges of increased globalization and competition.

Overall, the projects have evolved around 3 main topics:

- E-invoices;
- E-commerce;
- Education and information.

The municipalities and counties were the primary drivers of the e-invoice project over a 5-year period from 2005-2010. In their capacity as buyers the municipalities and counties have used an implemented electronic invoice management system as an incentive for suppliers to convert to using e-invoices. In total 18 e-invoicing projects was conducted during the program period and the projects affected in total 4.300 businesses.

E-commerce projects have mainly been driven by companies' own organizations to facilitate trade and business collaborations between companies, often between a group of companies with a previously established business relationship. The E-commerce projects (11 individual projects were carried out the program period) have reached a total of about 600 companies.

The E-commerce project aimed at supporting companies with the introduction of secure e-commerce solutions, and project funds were used to purchase external expertise. To be eligible for project funding, at least four SMEs had to be included in one project.

Also projects concerning training have been implemented in various forms. In Skåne Region the projects have in particular focused on internet training in order to enhance the IT-skills of especially farmers. These projects have been supplemented by information about the benefits of using IT in SMEs and how increased use of IT can promote collaboration between SMEs.

Public authorities involved

The Ministry of Enterprise, Energy and Communications is responsible for the development of the IT-strategy in Sweden, while the Swedish Agency for Economic and Regional Growth – Tillväxtverket, the Regions are responsible for the implementation.

ICT and ICT based Innovation

Facts (for the Øresund Region)

There are close to 100.000 employees in the ICT sector in the Øresund Region, whereof 60% work within ICT-service & Consultancy where computer programming is the largest industry. Furthermore more than half of the employees work in a foreign-owned company.

There are about 10.000 ICT companies in the Øresund Region. In addition to this there is on average 1.000 start-ups within the ICT cluster each year.

Skåne

The ICT cluster of the Øresund Region has a turn-over of € 21.7 billion. To put that into perspective it corresponds to 7% of the total workforce account for 23% of the turnover in the region.

Between 2007-2009 there were 31 foreign investments in the ICT cluster of the Øresund Region. Moreover the region had, as one of the only regions in Europe, an increase in the number of foreign investments in this period. The investments follow the general trend in the rest of Europe where the main part of the investments take place within ICT-services & Consultancy with US as the primary investor. For the Øresund Region specifically it is interesting that there is a difference in the origin of the investors investing in Sweden and Denmark, respectively.

Generally seen the total number of R&D employees in the Øresund Region is around 43.000, thus there is a strong research foundation in the region.

Within the ICT-cluster there is close to 14.000 R&D employees. In other words, ICT constitutes more than 32% of all research and development in the region in terms of employment, making it one of the largest pool of R&D resources in the region. At the universities there are around 600 ICT research employees counted in man-year. This number has increased with about 20% over the past 5 years. Thus most of the research takes place in the private sector, which employs 13.000 R&D employees.

There are 19 universities in the region of which 13 offers ICT educations (in this number however Lund's university has been counted several times, as i.e. Campus Helsingborg is seen as an independent unit). When referring to ICT education, it is defined as medium long or long higher education (BA/MSc) consisting of minimum 90 ECST points ICT or 3 terms of pure ICT. This definition means that some newer ICT educations where ICT has merged with traditional subjects are not counted i.e. IT & health and IT & Cognition.

Each year there are 8.000 enrolled ICT-students in the region. This number has increased with 12% over the past 5-6 years. On average approximately 1.500 BA or MSc graduate each year. Furthermore there are 500 enrolled PhD students and year about 100 of these graduate. The number of graduated PhD students has increased with 60% in the last decade.

There are very strong eco-systems in the region, where MNEs like IBM, Microsoft, Sony Mobile, ST Ericsson among others are at the core of these. Some of the strongest and most potential areas of development are:

- Information Management
- Mobile
- Vision
- Satellite navigation
- Wireless
- Gaming
- E-health
- Energy
- Finance
- Sound and acoustics
- Security

Within the last couple of years new cluster initiatives in relation to ICT have been implemented in the Øresund Region. Unlike Cluster 55 these initiatives focus on niches e.g. Mobile heights, Copenhagen Finance and IT region: Media Evolution and Sustainable Business Hub (environment and energy).

At Cluster 55° we focus on the following activities to support ICT based innovation:

- Internationalization activities;
- Match-making (between companies and between companies and universities);
- Network activities;
- Supporting start-ups;
- Attracting investments and HR through branding and development of projects;
- Involvement in policies.

General Innovation Policies

In 2011 Skåne Region, the Research and Innovation Council for Skåne (FIRS) and Sounding Board for Innovation in Skåne (SIS), took to initiative to create a 2012-2020 international innovation strategy for the Region. The innovation strategy forms a strategic basis for the

national innovation strategy that the Swedish Government intends to adopt in 2012. The regional strategy is still work-in-progress but the main strategic goals are:

- Strengthen the support structure for businesses;
- Improve access to risk-capital;
- Increase internationalization of supporting bodies;
- Develop unique international capability by stimulating knowledge based open innovation arenas and by engaging in international collaboration;
- Use public procurement to support the development of system innovations;
- Play a leading international role when it comes to offering attractive solutions to major challenges such as a sustainable long-term environment, a sustainable energy supply, an ageing population and effective integration;
- Attract research institutes to the region;
- Find new ways of increasing access to universities and institutes of technology for SMEs.

TARTU SCIENCE PARK

Estonia

Broadband availability and future development

Estonia is among the developed countries in the world when it comes to broadband availability and internet usage rates. According to InternetWorld Stats the Internet penetration in Estonia by the end of 2011 was 77,5% of the population. The Estonian Statistical Bureau notes that 66,2% of the households have a regular Internet connection subscription and 70,8% of households have an Internet connection. More than 51% of those households have a broadband connection (meaning that over 35% of all households have a broadband connection).

The Digital Economy Rankings 2010 place Estonia 25th in the world for „connectivity" (Connectivity measures the extent to which individuals and businesses can access the Internet and mobile networks, and do so affordably with an assurance of quality, reliability and security. This includes broadband penetration rates, affordability and quality.). For Internet penetration as well as „connectivity" measures Estonia is right behind most Western European, North American and East Asian countries, but is the leading country in Eastern Europe and ahead of most Southern European countries. As for the availability of (free) Wifi connections Estonia might be one of the leading countries in the world. There is free public Wifi available almost everywhere in public places in Estonia as for example in public squared, busses, trains, etc.

Estonia is actively seeking to improve the availability and quality of Internet. This includes a project named EstWin, which aims to give all residential houses, businesses and authorities a chance to connect to the next-generation broadband network with a transmission speed up to 100 Mbit/s by the year of 2015. In the scope of EstWin project more than 6000km of fiber-optical cables will be installed and more than 1400 connection points will be constructed. The construction of basic network should provide that 98% of the residential houses, businesses and authorities are located closer than 1.5 km from the basic network. The first stage of EstWin was completed by August 2011 and by the end of 2012 2500km of fiber-optical cables should

be installed. The EstWin project is co-funded by the European Union. All telecom operators are also cooperating in the EstWin project as well as in other initiatives to increase the availability, quality and use of broadband connections. Estonia is very interested in staying among the leading countries in the world in Internet connectivity and has well understood the benefits of wide broadband availability.

ICT Adoption in SMEs

ICT adoption by Estonian SMEs has been less active than among private users. There is a very strong community of ICT based small enterprises and start-up companies in Estonia, but longer established SMEs in sectors not directly related to ICT have been slower to adopt ICT. Therefore Estonia is ranked lower in the Digital Economy Rankings 2010 in the „Business environment" (31st) and „Consumer and business adoption" (28th) categories compared to other criteria. According to the Estonian Statistical Bureau the ICT usage rates vary significantly across different sectors. Especially agricultural sector and construction companies are below average in ICT use (for example only 4,5% of agriculture firms have an extranet), while ICT and financial services sectors are well above average. The size of companies is also a factor – bigger companies use more ICT. This may be the reason for relatively lower adoption of ICT among SMEs – the Estonian SMEs are on average smaller than SMEs in most other countries.

The World Economic Forum's The Global Information Technology Report 2012 finds that Estonia is 28th in the world in the „Business usage" of IT (behind „Individual usage" (22nd) and „Government usage" (16th). However, Estonia is ranked 3rd (!) in the world in „Extent of business Internet use".

The ICT adoption by Estonian SMEs is growing and there are many success stories. There are also new applications and services being developed that are targeted towards SMEs. The Estonian Association of Information Technology and Telecommunications (officially abbreviated as ITL) along with universities are actively supporting initiatives to encourage SMEs to use more ICT and also train the staff to be able to do so.

ICT and ICT based Innovation

Estonia has become known in the world for its many innovative ICT start-ups as well as innovative ICT use by the public sector. Estonia is the birthplace of Skype (originally developed by Estonian programmers and IT visionaries) and is still the development hub for the

company. Many Estonian ICT start-ups have been successful in the world recently. Companies like ERPLY (retail software - winner of Seed camp 2009), Taxipal (multi-language taxi ordering and brokering service - winner of NAVTEQ Global LBS Challenge® 2009), Fortumo (mobile payment portal - winner of Best Nordic Mobile *Startup* 2009), ZeroTurnaround (java developer – winner of Jolt-Jax Innovation-Duke's Choice- Innovator of the Year Awards in 2011), CrabCAD (unified CAD services marketplace – winner of Seedcamp 2011) and others have been able to impress in the world. Their success in turn is motivating others in Estonia to try with innovations as well and is also bringing better support and financing opportunities.

Estonia has been successful in implementing its e-government model, which includes possibilities for citizens to participate in elections over internet and paperless working of the government. This model has even been exported and implemented by other countries. For exporting its digital-democracy technology Estonia has an e-Governance Academy which has given advice and training to bureaucrats from more than 35 countries. Innovations like e-elections, digital prescriptions, buying buss tickets and paying for parking using a mobile phone and ID card among others have indeed been useful. However, some recent innovations, like the complete e-healthcare platform, still need more work. There have been some municipality supported innovations as well, for example the mobile parking in Tartu.

Estonia is also hosting the EU IT Agency and NATO Cyber Defense Centre.

General Innovation Policies

A general policy with most influence on ICT is the education policy. The new education policies for basic school and high-school levels put more emphasis on the use of IT tools and e-learning. The Tiger Leap project has been fairly successful at helping schools get the IT hardware and in providing trainings for teachers. Some schools are now looking into using new devices, such as tablet computers and smartphones, to take e-learning onto another level. Universities have been adding more and more ICT related courses to their curriculums, recently also focusing more on mobile technologies and software. So education policies are aiming at supporting ICT innovation in Estonia.

Estonia

Also supporting ICT innovation are legislative policies that enable digital technologies to be used for new services. For example the various services and functions related to ID card would not be possible without the legislative support.

This report is published by the

BORDWIIS+ project,

co-financed by the ERDF

and made possible by the

INTERREG IVC programme.

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