

RIP-WATCH

ANALYSIS OF THE REGIONAL DIMENSIONS OF INVESTMENT IN RESEARCH

CASE STUDY REGIONAL REPORT: LORRAINE (FRANCE)

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Case Study Regional Report on the Regional Dimensions of Investment in Research

OBJECTIVE

The main objective of this regional case study report is to provide a better understanding of the structural and techno-economic characteristics of the European region analysed, to present the key factors conducive to increased investment in R&D and to identify the key R&D policy challenges the region is facing.

BACKGROUND

In partnership with DG Research, the Institute of Prospective Technological Studies of the Joint Research Centre (JRC-IPTS) has been conducting a watching brief on policy developments aimed at promoting both private and public investment in R&D (RIP-WATCH). A stated aim of this policy watch activity is to take stock of developments aimed at increasing investments in R&D in the European regions.

In the design phase of the activity, a typology of the European regions was produced. A balanced mix of regions was selected from each of the nine regional types identified, representing fifteen member states of the European Union.

REGIONS COVERED

Phase 1		Phase 2	
1. Andalusia (ES)	2. Catalonia (ES)	11. Bavaria (DE)	12. Corsica (FR)
3. Carinthia (AT)	4. Crete (EL)	13. Emilia-Romagna (IT)	14. Etelä-Suomi (FI)
5. Dél-Dunántúl (HU)	6. Jihozápad (CZ)	15. Lorraine (FR)	16. Midi-Pyrénées (FR)
7. Norte (PT)	8. Sicily (IT)	17. Saxony (DE)	18. Scotland (UK)
9. Styria (AT)	10. Wielkopolskie (PL)	19. Västsverige (SE)	

THE REPORTS

The regional reports are structured according to the following two interrelated dimensions of regional techno-economic systems:

- **Regional knowledge base**, including the research, technological development and innovation (RTDI) infrastructure, human resources, RTDI efforts and outcomes and knowledge-transmission mechanisms in the region.
- **Regional economic structure**, including the productive structure, regional clusters and networks, international position and financial capacities and instruments.

Each report examines these dimensions from two points of view: their current state, as reflected in a selected set of regional indicators, and their policy context (i.e. policy framework, actors, objectives and instruments).

In addition to the regional case study reports, a **synthesis report** will be produced that combines and interprets the information contained in the case study reports. This will present the strengths and weaknesses of the regions covered and the factors that determined the trajectories of development of their R&D and innovation capacities. It will also discuss the main R&D and innovation challenges identified.

The JRC-IPTS launched the second phase of the activity in December 2006 with the contribution of the ERAWATCH Network. The work was undertaken between December 2006 and May 2007 by a project team led by LOGOTECH S.A. (EL) with the participation of Advansis Ltd, (FI), Faugert & Co Utvärdering AB (SE), Fraunhofer Institute for Systems and Innovation Research (ISI) (DE), Institute for Policy and Practice of Centre on Knowledge, Innovation, Technology and Enterprise (KITE) of University of Newcastle (UK), PREST – Manchester Institute of Innovation Research (UK), and Technopolis France (FR).

The regional case study reports produced in the study are now available on the ERAWATCH web-site at <http://cordis.europa.eu/erawatch/index.cfm?fuseaction=intService.home>

The synthesis report will also be available on the ERAWATCH web-site.

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Abbreviations

MC	Management Committee
PM	Project management
ToR	Terms of reference
ANBERD	Analytical Business Enterprise Research and Development Database
BERD	Expenditure on R&D in the business enterprise sector
EPO	European Patent Office
GBAORD	Government budget appropriations or outlays for R&D
GDP	Gross domestic product
GERD	Gross domestic expenditure on R&D
GUF	General university funds
HERD	Expenditure on R&D in the higher education sector
ISIC	International Standard Industrial Classification
IPTS	Institute for Prospective Technological Studies, Seville, Spain
NACE	Statistical Classification of Economic Activities in the European Community
n.e.c.	Not elsewhere classified

1 Introduction

Lorraine ranks 13th in terms of size of territory amongst the 22 French Metropolitan regions, and 10th in terms of population, with 2.3 million inhabitants. The region's density is 98 inhabitants/km², which is under the French average (108 inhabitants/km²). The population decreased between 1975 and 1990 but has stabilised since. Over 25 years, the region has lost 0.8% of its population.

In the 19th century, the Industrial Revolution turned Lorraine into one of the key areas for development in France. Its mines provided the coal and iron that were required for the growth of industry as a whole. Mining and industries such as metalworking, textiles and chemicals proved to be an outstanding driving force behind Lorraine's prosperity for nearly a century. However, in the 1980s, Lorraine faced a decline in its traditional areas of employment. Conversion and redeployment of its industrial structure became the keywords for Lorraine's economy.

Figure 1: Lorraine in Europe



Source : CCI Lorraine,
http://www.lorraine.cci.fr/francais/c1/100_2.htm

Today, Lorraine's economy is more diversified, based on traditional sectors such as farming and forestry, as well as on food processing, industry (Saint-Gobain-Canalisations etc.), chemicals (Solvay, Rhône-Poulenc, etc.), car manufacturing (Smart plant in Hambach – Daimler-Chrysler group, PSA) and outsourcing for the automobile industry. Other activities have also developed, mainly linked to the region's geographical position, among them logistics and service companies (Ikea Distribution France, Bertelsmann, DHL, etc.) or services for businesses or private individuals (call centres, etc.). They strengthen the renewed dynamism of a region that is resolutely European in its outlook: during the 1990s, Lorraine ranked first or second (depending on the years) for inward investment amongst French regions.

In 2004 the Lorraine region accounted for 3.1% of France's GDP. With a GDP per inhabitant of €22 005, the region is ranked 20th, far below the best region (Île-de-France, with €41 662) and the national average of €26 788¹. The region is an "all-rounder" in terms of its contribution to the French economy. In 2003, the contribution of the region's industry represented 3.8% of France's gross value added of the industrial sector. The region's contribution to other branches was: 3.4% of France's gross value added of the construction sector, 2.8% of the agricultural sector, and 2.6% of market services.

The Lorraine region's principal asset is its prime geographical position close to the Rhine corridor at the heart of Europe. Lorraine occupies a privileged geographical position in Europe. The only French region to share its borders with three European countries, Belgium, Luxembourg and Germany, Lorraine is an outstanding gateway to the European Union.

¹INSEE website.

2 Regional knowledge base

2.1 Description of the regional knowledge base

2.1.1 Knowledge creation capacity

General data²

According to the regional innovation scoreboard 2006, Lorraine is ranked 121st among the 208 European regions. R&D spending in Lorraine amounted to 547 million euros, which is 1.1% of the region's GDP, far below the national and European average – respectively 2.2% and 2.0%. R&D in Lorraine is mostly performed by the public sector, with 54.3% of total R&D spending in 2003 as against 37.4% for the national average. In terms of research staff too, the public sector provides the majority of resources, with 60.4% (4 155 FTE) of total regional research staff. Researchers from the public sector represent 63.7% (2 039 FTE) of total researchers.

R&D figures reporting the trend from 1991 to 2003 show a contrasting evolution of the three main R&D spending sectors in Lorraine (see Table 3 and Table 4):

- for the business sector, the figures expressed as a percentage of the national data remain the same over the period (1.14% of national business R&D expenditures in 1991 versus 1.15% in 2003, even if the figures in volume terms increased by 50% (from €164m in 1991 to €249m in 2003);
- the share of the higher education sector almost tripled as a percentage of the national figure (from 1.28% in 1991 to 3.56% in 2003);
- the government sector increased slightly in the national share (0.60% to 1.01%).

Figures on human resources in science and technology (Table 5) reflect a stronger increase in Lorraine than in France between 1994 and 2006. Lorraine reached in 2006 the national rate for 1994 (about 30% of HRST in active population).

Public actors

As previously described, the Lorraine public sector is the most active player in R&D. Spending on public research amounted to 297 million euros in 2003 or 0.6% of the region's GDP. Lorraine ranked 8th at national level for public R&D intensity. Public R&D spending is mostly performed by universities – 54% of total public R&D spending in the region. Lorraine hosts four higher education institutions³, of which one is a national engineering school⁴. Two universities are located in Nancy and one in Metz. Their size goes from 15 800 to 18 000 students (see Table 1), which is about the French average (17 000). In 2004, there were 76 350 students in Lorraine (ISCED 5 and 6), representing 4% of students in France⁵. In 2004, 4% of Lorraine students (2 931) were enrolled on a PhD programme.

In 2005-2006, 3.4% of French students were enrolled in Lorraine higher education establishments. Some fields are over-represented, attesting to regional specialisation: Agriculture, forestry and fishery (5.1%), Engineering and engineering trades (6.1%), Manufacturing and processing (7.9%). Manufacturing and processing is even more highly represented at doctorate level: 15% of students enrolled on a PhD programme in France in Agriculture, forestry and fishery are enrolled in a HEI located in Lorraine.

² INSEE website.

³ Metz - Université Paul Verlaine; Nancy 1 - Université Henri Poincaré; Nancy 2; INPL.

⁴ There are only three of these engineering schools in France (the other two are located in Grenoble and Toulouse).

⁵ Eurostat website.

The major French public research organisations have research laboratories in Lorraine: the National Centre for Scientific Research (CNRS), the French National Institute for Agricultural Research (INRA), the National Institute for Research in Computers and Control (INRIA), and the National Institute for Health and Medical Research (INSERM). There are 34 CNRS research units in Lorraine. These research units are often joint research units (UMR) working with other public research institutions in the region. 1 249 researchers work in research labs involving the CNRS. The fields covered by the CNRS research units are engineering (29%); mathematics, physics, the earth and universe (26%), chemistry (18%) and social sciences (15%).

The 20 research units in which INRA is involved have around 500 research staff in Lorraine, of which 120 teachers-researchers belonging to universities. Eight of the research units are joint research units working with universities (Nancy 1 and INPL) or another public research organisation. The INRA research in Lorraine is focused on wood and forestry, quality of agriculture and food production and the environment. The budget amounted to about 5 million euros in 2000, of which one fourth comes from research contracts.

Private actors⁶

The contribution of enterprises to R&D in Lorraine is weak compared to the national average. In 2003, enterprises in the Lorraine region spent only 0.5% of Lorraine GDP on R&D (approx. 250 million euros), which placed the region in 18th position, the national average being 1.4% of regional GDP. Between 1997 and 2003, BERD grew by 6.4% whereas the national growth rate was about 25% over the same period.

The figures for R&D staff show the same low weight of the private sector, which accounts for 2 724 R&D staff (FTE) including 2 039 researchers (FTE) – 36% of total researchers in Lorraine. Between 1997 and 2003, the number of enterprises' R&D staff decreased by 9.4% while this figure grew by 16.2% on average for France. 38% of researchers work in SMEs (25% for France) and 36% in large enterprises (58% for France).

Investment/funding

In 2003, companies with more than 1 000 employees performed 56% of the private investment in R&D (65% at the national level). This, however, does not testify to a strong weight of SMEs in the research infrastructure, but rather to a relatively low number of large companies performing R&D in Lorraine. Hence, companies with more than 2 000 employees located in Lorraine contributed to 0.9% of R&D spending by French companies with more than 2 000 employees⁷. Large companies that are key players in R&D in Lorraine belong to the traditional sectors of the iron and steel industry. In 2003, Arcelor Research employed around 500 staff for a budget in R&D that represented around one fourth of the private R&D expenditures in Lorraine. Mittal and Ascometal also have research centres in Lorraine.

In 2002, only 176 companies filed a form to benefit from the Corporate Tax Credit on Research Expenses. 63 of them did actually benefit from the measure to the tune of 3 million euros (for a total of 68 million euros of R&D expenditures). In terms of volume, more than one half of R&D expenditures were made by the sectors of metal processing and automotive manufacturing⁸.

All in all, as regards R&D, the region displays a deficit in high-technology sectors such as electronics, chemicals and pharmaceuticals as compared with the French landscape.

⁶ http://www.insee.fr/fr/insee_regions/lor/publi/tableaux.htm.

⁷ OST (2006), *Indicators in S&T*.

⁸ Economic and Social Council of Lorraine (2004), *Innovation in Lorraine*.

Outputs

For the period 2000-2003, 260 patents on average per year were applied for (1.9% of the total of patents applied for through the national route). Around one third of them were related to the consumption of households. Lorraine also shows a specialisation in industrial processes and in chemicals and materials. The region presents relative weaknesses in electronics and electricity as well as in instrumentation. Regarding applications to the European Patent Office, Lorraine contributed 2.0% of the total for France in 2004, whereas this figure was 2.4% in 1999. The technological density (number of patents applied for divided by the population) of Lorraine corresponded to half that of France in 2004. Clearly, Lorraine remains in the group of regions that are falling behind.

Regarding publications, Lorraine accounted for 3.0% of all French scientific publications whilst it contributed 1.6% of national GERD in 2003. Lorraine is therefore part of the 10 French regions contributing the most to French publications. Between 1999 and 2004, publication production in the region did not evolve. In terms of scientific fields, Lorraine accounts for 5.0% of all national publications in engineering (5th position after Ile-de-France, Rhône-Alpes, PACA and Aquitaine) and 4.0% of all publications in chemistry. The number of publications as a share of total French publications declined by 5% between 1999 and 2004 in engineering but did not change in chemistry⁹.

2.1.2 Knowledge diffusion capacity of the region

There are different knowledge diffusion structures and research and technology transfer structures in Lorraine, which have been in place since the 1980s. Each of the four universities has its own research and technology transfer service, but a step forward has been achieved with the recent (2005) implementation of the CERES project¹⁰, the objective of which is to gather together the four universities' services. Data for the INPL and the Nancy 1 University show some start-ups, but the overall result is rather weak compared to other French public research institutes. Between 1999 and 2005, the INPL created 10 enterprises and Nancy 1 only 4. Only 6 of the INPL enterprises are still active after 4 years while the four Nancy 1 enterprises still exist. The weak point is that none of these enterprises have managed to attain critical size. For instance, the average staff is 3 to 4 persons.

The Universities of Lorraine created the Lorraine incubator in December 1999¹¹. The INRIA and the Association of "Grandes écoles" of Metz joined them in 2001. The incubator is located at the Nancy 1 University, and is headed by the University President. In 2005, the incubator was financed by the Ministry of Higher Education and Research (50%), the Regional Council of Lorraine (26%), the European Social Fund (16%) and the local government of Nancy (6%) for a total of about 600 000 euros. The incubator has developed strong links with other structures involved in business creation. Between 2000 and 2006, the incubator supported 40 projects, of which 13 were from public research¹² and 27 were linked to public research¹³. 29 projects have exited from the incubator, 19 enterprises have been created and 17 are still active¹⁴.

Lorraine hosts 5 Technology Platforms. The aim of these platforms is to strengthen the links between technical high schools and SMEs. The high schools' students provide different

⁹ OST (2006), *Indicators in S&T*.

¹⁰ This project has been awarded a 1 million euro grant for three years by the National Agency for Research (ANR).

¹¹ Technopolis (2006), "*Panorama du dispositif d'incubation*", Report for the Ministry of Higher Education and Research.

¹² Projects that exploit the results of public research.

¹³ Projects that do not originate from public research but are supported by a public research laboratory.

¹⁴ Technopolis (2006), "*Panorama du dispositif d'incubation*", Report for the Ministry of Higher Education and Research.

services to SMEs (use of specific equipment, etc.) The 5 platforms are each specialised in one theme, respectively wood, engineering, agri-food, textiles and platurgy processes.

Lorraine also has 8 regional centres for innovation and technology transfer (CRITTs). The CRITTs were created in the 1980s in France to improve the technological calibre of SMEs/SMLs. They are technological resource centres for SMEs based on the locally available competencies (PRI). Each CRITT is specialised – ICT, agri-bio industries, engineering, water, wood. Lorraine has one of the highest numbers of CRITTs on its territory, together with Ile-de-France.

2.1.3 Knowledge absorption capacity of the region

The efforts made to absorb new knowledge can be reflected in the share of population engaged in life-long learning. For 2004, Lorraine data were about the French average with 6.5% of the region's adult population (aged 25-64) engaged in life-long learning. Lorraine, like France in general, has to catch up with the EU 25 figure of 8.7%.

The share of human resources in S&T (as a percentage of the population) has grown from 12.3% in 1994 to 17.9% in 2005. In comparison, the figures for France were 16.3% in 1994 and 21.1% in 2005. The share of human resources in S&T (as a percentage of the active population) has grown from 28.7% in 1994 to 40.3% in 2005. Lorraine is slowly catching up with the French average. The gap was 6 points in 2004 as against 8 points in 1994.

2.2 Policy context

2.2.1 Governance structure and actors

In the 1980s, regions were given responsibility for managing high and vocational schools, life-long learning, economic development and regional transport. In recent years, the devolution process was stepped up. The Law of 13 August 2004 provided the regions with more competences, in particular in the fields of economic development, tourism, life-long learning and health. Relationships between the State and the regions are organised through State-Region Projects Contracts (CPER)¹⁵ that are signed for several years. In each region, the contract presents the priorities and responsibilities of the Regional Council and of the State.

Concerning Lorraine, the first CPER was signed for the period 1984-1988, committing 626 million euros, of which 74% was provided by the State and 26% by the region¹⁶. The 4th CPER signed for the period 2000-2006 amounted to 1 498 million euros, of which 55% was financed by the State and 45% by the region¹⁷. The current one, which was recently signed for Lorraine, covers the period 2007-2013.

Traditionally, French policies were predominantly driven by a spatial planning logic. As far as research, innovation and education are concerned, the notions of excellence, critical mass and visibility of education and research actors have seriously challenged this logic in recent years. As a matter of fact, the spatial planning logic vanished in those fields and an actual devolution process is now taking place. This statement holds for the State's representation in the regions as well as for the public research organisations' representations in the regions. In practice, this means that the State and the public research organisations have shifted their strategy from a

¹⁵ The previous CPERs were called State-Region Plan Contracts.

¹⁶ At national level, the distribution of funding between the State and the region was 60%-40% for the 1st CPER and 50-50% for the 4th, showing that regions are getting more and more involved.

¹⁷ DIACT: [http://www.diact.gouv.fr/datar_site/datar_CPER.nsf/\\$ID_Chapitre/CLAE-569DB9](http://www.diact.gouv.fr/datar_site/datar_CPER.nsf/$ID_Chapitre/CLAE-569DB9). See Table 9 in Annex 3.

national to a regional one. For example, in 2005, the National Centre for Scientific Research (CNRS) adopted a strategic plan aimed in particular at reinforcing its regional strategies and strengthening its partnership with the regional and local authorities¹⁸. The strengthening of the regional strategies of the national public actors goes hand-in-hand with an increasing role given to the region regarding research issues. The General Code for Regional and Local Authorities indicates that “*the Region is associated with the framing and application of the national research and technology policy*” (Article L4252-1). It also mentions that “*for the execution of multi-annual programmes of regional interest (...), the Region can contract for a limited duration with the State, public or private research organisations, public establishments, technical centres or enterprises*” (Article L4252-2). On this basis, some regions have set up a regional Research and Higher Education Plan. Rhône-Alpes was the first region to do so in 2005, followed by Provence-Alpes-Côte d’Azur, Brittany, etc. Lorraine has not drawn up such a strategic document. However, the Regional Council produced a Strategic Plan for Economic Development that takes research and innovation issues into account.

Regions autonomously decide the budget they spend on R&D and innovation. This leads to varying levels of research and innovation funding. For example, the item “higher education and research” represented 18.4% of Île-de-France’s State-Region Contract Plan for the period 2000 to 2006 but 13.2% for Lorraine. The annual budget for this item in Lorraine was expected to reach 33 million euros per year, corresponding to 0.08% of regional GDP.

Regional funding in R&D in the national landscape is very limited: in 2003, the total budget for research and technology of the regional and local authorities represented 4.1% of the total public budget for R&D.

2.2.2 Policy objectives

In the 1990s, Lorraine’s support for research was rather disconnected from support for economic development. On the one hand, thematic priorities were identified on which the regional authorities were to focus. For instance, the State-Lorraine Contract Plan for the period 1994-1999 identified four priorities: quality and security of processes and products; modelling and high performance systems; labour, employment and training, law and management; biology and health. The objective was to increase the supply of regional research actors focusing on these priorities. On the other hand, the regional authorities put the emphasis on the economic development of the region. The objective was to adapt the region’s economic structure. One of the means was to increase the technology awareness of companies. However, the approach was rather sector-neutral in the sense that the aim was to not build technology transfers on the regional research strengths. The support for companies to increase their technological standard was provided hand-in-hand with the former French Agency for Innovation, ANVAR, which is now called OSEO innovation.

The State-Lorraine Contract Plan for the period 2000-2006 showed a shift in the way research and technological development was handled. The chapter “research” identified four objectives aimed at increasing the attractiveness of the region: the reinforcement of technological research, the reinforcement of technology transfers, the strengthening of innovation and the creation of jobs. The chapter “research” of the State-Region Contract Plan for Lorraine for the period 2000-2006 identified six “research programmes”:

- Integrated engineering (11.9 million euros);
- Intelligence software (11.4 million euros);
- Sustainable management of soils, agri-resources and environmental resources (6.3 million euros);

¹⁸ General Inspectorate of the Administration of Education and Research (2005), *Research and Territories*.

- Bio-engineering (2.1 million euros);
- Industrial security and waste (EUR 2.1 million);
- Development of regional and European areas (EUR 1.1 million).

These research programmes were expected to be partially funded by the National Centre for Scientific Research (CNRS) (3.7 million euros), the National Institute for Agricultural Research (INRA) (2.0 million euros) and the National Institute for Research in Computers and Control (INRIA) (4.7 million euros). Practically, each research programme corresponded to a Scientific and Technological Research Cluster (PRST). A specific research programme, called “After coal mines” was also designed for supporting two *ad hoc* research programmes. A budget of 6.1 million euros was earmarked, shared evenly between the region and the State.

The current State-Lorraine Projects Plan has reaffirmed the role of the thematic priorities that were identified in the past. The research priorities are now presented in five areas covering the same thematic fields: materials, energy, process and products; environmental sciences; bioengineering and health; modelling, information and numeric systems; human sciences.

Regarding national policy affecting the regions, the logic of spatial planning has been smoothly replaced by a logic of reinforcement of national strengths. In the 2000s, the State started entrusting the regions with wider powers regarding economic development and research. At the same time, the State has reinforced its national policy in the regions as regards economic development and research. In order to give a new impetus to its research and innovation policy, in 2004, the Government designed a new instrument, called Competitiveness Clusters, aimed at reinforcing relationships between research and innovation actors from both the public and the private sectors. The logic of Competitiveness Clusters is to create regional poles of excellence in accordance with regional strengths, and international visibility. In July 2005, the Government identified 67 Competitiveness Clusters, two of them located in Lorraine: MIPI, dedicated to innovative materials, and Grand-Est Natural Fibres, specialised in fibres.

In conclusion, the need to implement proactive research and innovation policies in regions has progressively arisen during the past two decades. Awareness of the importance of RTD policies has increased in parallel with the growing power given to the regional authorities as regards economic development. This has undeniably reinforced the coherence of regional policies. As far as Lorraine is concerned, there are strong synergies between the different instruments aimed at strengthening the economic development of the region and at reinforcing the knowledge research base. Clearly, the focus has been put on linking regional economic growth to knowledge research on the one hand and on reinforcing the research base on the other.

2.2.3 Policy instruments

The main policy objectives and instruments at national level affecting the region and policy objectives and instruments at regional level are presented in Exhibit 1.

Improving RTD governance

In 2005, in the wake of the increasing responsibility given to the regions, the Regional Council of Lorraine set up workshops, involving in particular the scientific community, to identify the objectives to be pursued in the context of the future State-Region Projects Plan (CPER). The whole project, called Conference for Higher Education, Research and Innovation, mobilised representatives from universities, public research organisations, centres of technology transfer as well as representatives from private companies. The rationale was to build a collective process for identifying a research strategy that would be shared by the actors. Several meetings were held from October 2005 to March 2006 on a few issues dealing with either the region’s priority thematic fields or cross-cutting aspects of research such as exploitation,

transfer, attractiveness, international visibility. Apart from providing an opportunity to ascertain the needs and views of the scientific community with regard to research, the Conference was a means of validating the pertinence of the choices made by the Regional Council as regards research thematic priorities.

Structural funds

Lorraine has benefited greatly from structural funds over the last 15 years. Lorraine was the main recipient (together with Nord-Pas-de-Calais) of the Objective 2¹⁹ programmes between 1989 and 1993 and received 19% of the funds allocated to France (see Table 9). The main policy objectives were to foster business creation and development and to increase the region's attraction via massive investments in infrastructure (57% of Lorraine Objective 2 allocated funds). Training and research issues were given a smaller amount of funding (10% of total Objective 2 funds for Lorraine). For the period 1994 to 1999, Lorraine again benefited from structural funds through different programmes²⁰ and was allocated 7.8% of French Objective 2 funds²¹. The share of Objective 2 funds dedicated to research and innovation was still small in the period 2000-2006 (0.6% of total Objective 2 funds allocated to Lorraine were RTDI measures; see Table 10).

Networking, co-location and clustering measures

For decades, the supply of research and higher education in France was based on a logic of spatial planning. The idea was to provide each and every part of the territory with one or more HEIs and PROs instead of aiming for scientific excellence. This approach was challenged in the 2000s. To be more specific, the Government designed two instruments aimed at bringing together research and higher education actors: the Higher Education and Research Clusters (PRES) and the Thematic Networks for Research (RTRA). As far as Lorraine is concerned, the Regional Council is actively supporting the Universities in their decision to create a PRES (which has not been achieved so far). This process started in 2005, when the three universities in Nancy decided to create an *ad hoc* structure, the federation "Nancy University". This structure was designed in the context of contracting with the State for the period 2005-2008. In 2005, the General Inspectorate of the Administration of Education and Research²² issued a fairly negative assessment of the project because of the lack of a real strategy. The report pointed out the direction the universities should take to really reinforce their visibility. It advocated the merger of the Nancy I University and the INPL, which already share their doctoral schools as well as all their research labs (except for the life sciences). Nancy may join them together in order to reinforce the links between engineering and management. The University of Metz may also be part of the project by merging with the Universities of Nancy.

Knowledge and technology transfer to enterprises

Already in the 1990s, the Regional Council was active on these points, hand-in-hand with the regional delegation of the former French Agency for Innovation, ANVAR. These instruments are seen as efficient measures to reduce the gap between the higher education system and the needs of industry, in particular SMEs.

Some instruments were specifically designed at regional level to support research within companies:

¹⁹ Objective 2: Regions undergoing conversion, frontier regions or parts of regions (including employment areas and urban areas) seriously affected by industrial decline.

²⁰ Objective 5b 1994-1999, LEADER II 1994-1999, Objective 2 1997-1999, RESIDER II 1994-1999, RECHAR II 1994-1999, KONVER II 1994-1999, RETEX II 1994-1999, INTERREG II 1994-1999 Wallonie-Lorraine-Luxembourg.

²¹ Centre for Strategy & Evaluation Services (2003), *Ex Post Evaluation of 1994-1999 Objective 2 Programmes, Synthesis Report*.

²² General Inspectorate of the Administration of Education and Research (2005), *Research and Territories*.

- Aid for the recruitment of a young graduate who would be assigned to the technological development of a company or to the implementation of a technology transfer from research;
- Grants for young entrepreneurs.

Support for public research

In practice, the role of the Regional Council of Lorraine is to be an adjunct to research institutions. Its sole responsibility is to give incentives to the research actors to carry out research activities in the thematic fields that are considered as priorities.

Since the 1990s, the Regional Council has had several instruments at its disposal to support higher education institutions located in Lorraine. The philosophy of these tools is to help regional research teams out in launching new research projects (provided that they are part of the research programmes considered as priorities).

Most of the time, the idea is to enable these research teams to recruit/host a researcher for a fixed duration or to launch a new research project. The instruments are all based on the principle of calls for proposals:

- Support for investment and operation related to the implementation of an innovative training programme aimed at reinforcing professional integration and based on ICT;
- Co-financing of PhD grants (up to 50%) distributed by an HEI or a PRO;
- Co-financing of post-doctoral grants (up to 50%) distributed by an HEI or a PRO;
- Support for new research teams and/or research projects (in line with the research thematic priorities of the Regional Council);
- Support for researchers for their integration in research institutes in Lorraine. The aid is targeted in particular at French researchers who work outside the region as well as foreign researchers;
- Support for visiting scientists hosted by a regional research institute;
- Support for the organisation of conferences.

In conclusion, policy instruments used by the regional authorities to support the research base have not changed over time but have been reinforced. The desire to boost the creation of knowledge in the fields that the regional actors are relatively good at drove the Regional Council of Lorraine to increase the budget for supporting researchers over time. In parallel, in order to increase the critical mass of public research as well as to increase the visibility of Lorraine's public research performers, efforts were made to network the different public research actors to each other. These two sets of instruments were developed jointly in order to increase the coherence of the regional public base.

Exhibit 1: RTD policy mix affecting the region

Policy areas ²³	Policy objectives and instruments at national* level affecting the region	Policy objectives and instruments at regional* level
Improving R&D governance	The regions have been given broader competences as regards economic development and research and innovation	The Regional Council organised a Conference for Higher Education, Research and Innovation in 2005 and 2006 that enabled a consensus to be reached regarding the thematic fields on which the research policy should focus.
Networking, co-location and clustering measures	Higher Education and Research Clusters (PRES) and Thematic Networks for Research (RTRA) are two instruments designed in 2006 in order to incite HEIs and PROs to reinforce their linkages	The region's HEIs have started developing synergies.
Knowledge and technology transfer to enterprises		The Regional Council has the objective of fostering technology transfer through existing networks as well as through grants given to companies for hiring highly qualified personnel.
Research collaboration between public research organisations and the private sector	Competitiveness Clusters are the main instruments that have been designed to facilitate transfer	The region hosts two Competitiveness Clusters, one on fibres and the other on innovative materials.
Supporting public research	Many new instruments have been designed in recent years to increase scientific excellence (in particular, the creation of the National Agency for Research)	The Regional Council has identified thematic fields that will receive specific support.
Financial incentives for R&D in the private sector	The Research Tax Credit was drastically reformed in 2004 and 2006 (introduction of a volume-based scheme and modification of eligible expenditures)	

[Policies at national level are those formulated and implemented by national actors even if they have a regional dimension, while policies at regional level are those under the complete and exclusive control of the regional authorities. Shared policies planned and/or implemented jointly by national and regional authorities, e.g. co-funding, will be regarded as regional.]*

²³ Compilation from typologies described in the literature, such as: Boekholt, P. et al (2001), *An international review of methods to measure the relative effectiveness of technology policy instruments*, Technopolis B.V., Amsterdam.

Soete, L. et al (2002), *Benchmarking National Research Policies: The impact of RTD on Competitiveness and Employment (IRCE)*, A STRATA-ETAN Expert Group Report, DG Research, European Commission, Brussels.

Guy, K. and Nauwelaers, C (2003), "Benchmarking STI Policies in Europe: In Search of Good Practice", *The IPTS Report*, Vol. 71, February, IPTS, Seville.

European Commission (2003), *Raising EU R&D Intensity: Improving the Effectiveness of the Mix of Public Support Mechanisms for Private Sector Research and Development*, Report to the European Commission by an Independent Expert Group, Brussels.

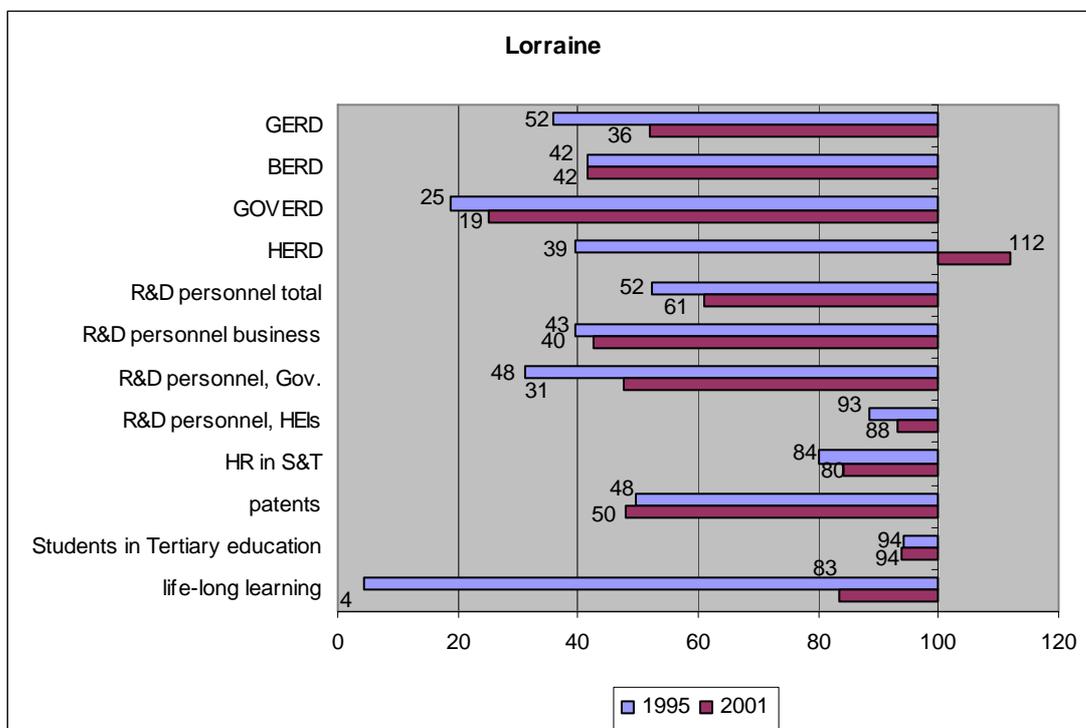
Also TrendChart has developed its own policy mix taxonomy.

2.3 Conclusions

Historically, the State-Regions Plan Contract for the period 1994-1999 enabled the regions to set up governance structures in the field of research, higher education and innovation. Concerning the policy strategy for research, Lorraine started a process at the end of the 1990s aimed at networking the actors and at focusing on the thematic fields that are based on the regional industrial structure and that the regional actors are relatively good at. Complementary instruments were given a larger budget over time to, firstly, put the emphasis on the regional research strengths and, secondly, reinforce the linkages between the regional research actors. To do so, the Regional Council of Lorraine has been distributing a larger number of grants to researchers.

The Law for Research, voted in 1999, put the focus on the need to close the gap between research and innovation. Several instruments were created in order to support transfers of technology from the research sphere to the industrial sphere. Some of these instruments were implemented in most of the regions, including Lorraine, such as the Technology Dissemination Networks (RDT), the Regional Centres for Innovation and Technology Transfer (CRITT) or the Technology Platforms. The reinforcement of the regional competences in economic development and research, in 2004, gave the regions the possibility to participate in the elaboration of the strategy of these intermediate structures and in the identification of their priorities. The Regional Council of Lorraine took this opportunity to better connect the supply of research and technology from these intermediate actors with regional needs. In order to identify these needs, the Regional Council of Lorraine held the Conference for Higher Education, Research and Innovation (2005). The consensus that emerged from this event is a positive development that bears witness to a common vision for Lorraine's research and innovation system. The participation of the actors in the Conference also shows the involvement of these actors in the regional economy.

Summary Graph 1: Comparison of Lorraine's knowledge base with France



Note: R&D personnel total, bus., gov., HEIs, students in tertiary education, life-long learning 2000, 2001

In spite of this strength, Lorraine is characterised by low figures with regard to R&D. GERD as a percentage of GDP in Lorraine represented around one third (36%) of the figure for France in 2001. Moreover, Lorraine never caught up with the national level. On the contrary, the region fell behind: GERD as a percentage of GDP in Lorraine equalled one half (52%) of that of France in 1995. The decrease in GERD as a percentage of GDP was due to the fact that GOVERD as a percentage of GDP grew faster in France than in Lorraine. Otherwise, the efforts made by the private sector evolved the same way in Lorraine as they did in France, but remained far from the national average (42%). Moreover, knowing that BERD as a percentage of GDP in France is rather weak (around 1.2%), this shows how the issue of private R&D expenditures is crucial in Lorraine. As regards R&D personnel, Lorraine presents the same patterns as for R&D expenditures: that is, a lower level of R&D personnel as a percentage of total employment than in France and a gap that increased between 1995 and 2001. The gap increased for the public sector as well as for the private sector. That said, there are more favourable figures in relation to the knowledge-based economy of Lorraine: the share of students in tertiary education per thousand inhabitants is almost the same as for France (94%) and remained stable from 1995 to 2001.

3 Regional economic structure

3.1 Description of the economic structure

3.1.1 Characteristics of the productive structure of the region's economy

In 2004, Lorraine's GDP amounted to 51 233 million euros, that is to say 3% of French GDP²⁴. GDP per capita amounted 22 005 euros, representing 82% of the figure for France. Regarding sectors, services provide the major share of value added in the region (71%; 75.9% for France). The agriculture sector accounts for 2.4% (2.6% for France), and the industry sector accounts for 26.6% (21.5% in France).

In terms of annual growth rate (gross value added at basic prices), the overall regional economy grew by 2.3% per year between 1995 and 2003, which is below the national average (+3.3% for all NACE sectors). The most dynamic sector has been the service sector (+3.5%) but this is still below the national average (+4.2%). Real estate, renting and business activities grew by 4.6%. In contrast, the industry sector declined over the same period (-1.0%), in particular the extractive industry (-10.6%) and manufacturing (-1.4%)²⁵.

In 2004, the productivity of Lorraine (calculated as value added/employment) corresponded to 86% of the national level²⁶. Agriculture and public administration achieve more than the national average productivity. Agriculture is strongly labour intensive (calculated using the proxy gross fixed capital/compensation of employees). With the same proxy, we see that the industry sector (excluding construction) is relatively much more labour intensive than the national average (36% Lorraine versus 26% for France).

The last 20 years have seen the transformation of the French productive structure, with the decline of the industry sector, compensated by services and construction²⁷. The number of local units amounted to 67 650 in 2004. The specialisation of Lorraine in different NACE sectors is as follows: mining and quarrying; manufacturing (especially food products and beverages, textile, wood and wood products, non-metallic mineral products); construction; wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods; retail trade, except of motor vehicles, motorcycles; repair of personal and household goods.

In 2001 in Lorraine, 39% of R&D expenses were incurred by medium-high technology manufacturing industries and 42% by medium-low technology manufacturing industries. Only 5% of BERD was spent by high technology manufacturing industries²⁸.

According to Eurostat, in 2006²⁹, 17.6% of Lorraine manufacturing sectors employees worked in the low and medium-low technology sectors versus 10.0% for France. In 2006, 6.6% of employment in Lorraine was in the high to medium-high technology manufacturing sectors, versus 6.3% in France. Innovative research is mainly performed within medium technology intensive sectors such as the iron and steel industry. For instance, large firms have research centres in Lorraine: Arcelor Research, a 500 R&D staff research centre specialised in carbon that represents one fourth of Lorraine's BERD. There are other private research centres in

²⁴ INSEE website.

²⁵ Calculation based on Eurostat data.

²⁶ Technopolis calculations based on Eurostat data.

²⁷ INSEE website.

²⁸ OCDE (2006), *Examens territoriaux de la France*.

²⁹ Eurostat (2006), *Annual data on employment in technology and knowledge-intensive sectors at the regional level*.

Lorraine such as Mittal Steel and Ascométal and its European research centre on special steels (CREAS³⁰).

Regarding the creation of enterprises in the innovative sectors³¹, the number of creations in 2004 accounted for 2% (197) of the total number of innovative enterprises created in France. Their weight as a percentage of the productive structure was 1.79% (versus 2.5% for the French national average). The rate of creation³² of innovative enterprises in 2004 was 16.6%, slightly above the national average (15.5%).

3.1.2 Systemic characteristics of the region

In order to gather companies, training centres and public and private research organisations around innovative joint projects, two Competitiveness Clusters were awarded the label, one in the field of innovative materials and intelligent products (MIPI) and one on natural fibres ("Fibres Naturelles Grand Est"):

- The MIPI cluster gathers together 3 000 enterprises, including international groups such as Arcelor Mittal Steel, Saint Gobain PAM, 700 private sector researchers and 160 experts with transfer skills. The MIPI cluster received funding from the ANR after the first call for proposals. The cluster performs its research activities with 5 private research centres and 27 public research laboratories within the four universities of Lorraine and other engineering schools.
- "Fibres Naturelles Grand Est" is an interregional cluster (Alsace and Lorraine) specialised in fibres and based on the traditional industries of the two regions: timber industry, paper industry and textile industry. This competitiveness cluster is based on university competencies and PRI resources (300 researchers). The cluster is also based on the resource centres of the region (CRITT for instance). The policy of competitiveness clusters being very new, it is difficult to give an initial assessment of the measure.

Along with these two Competitiveness Clusters, Lorraine hosts 3 Local Productive Systems³³ (SPLs):

- one in the sawing industry connecting 12 enterprises and 300 employees;
- one in the industry of wood-made furniture³⁴, bringing together 120 local units and 3 500 employees;
- one specialised in mechanical engineering and precision mechanics³⁵.

3.1.3 The regional economy in the international context

In 2004, Lorraine was the 3rd region in France (after Île-de-France and Rhône Alpes) in terms of employment due to foreign investments, with 2 886 jobs representing 9.8% of the total³⁶. In 2003, Lorraine accounted for 5.5% of national exports and ranked 7th³⁷. Lorraine exports

³⁰ http://www.lucchini.it/rs_lucchini/about_rd/presentazione_hagondage.asp?language=fr.

³¹ Defined by the INSEE as: ICT, pharmaceuticals, biochemistry and new materials.

³² Calculated as the number of enterprises created/the stock of existing enterprises on 1 January of the same year.

³³ The SPLs are productive organisations focused on a particular topic and settled in a definite territory. Various enterprises work in interaction with each other and share part of the workload in terms of production, services, research, economic intelligence, technology transfer centre, etc.).

³⁴ www.plab.org/.

³⁵ www.meuse-mecanique.com.

³⁶ AFII (2005), *Bilan des investissements étrangers en France, Synthèse des résultats 2004*.

³⁷ INSEE (2005), *Tableaux de l'économie Lorraine*.

mainly industrial goods (automotive industry, metal processing, mechanics and energy from the nuclear power stations). 90% of Lorraine exports are directed towards Europe; 30% of exports go to Germany. The total value of exports was 17 612 million euros in 2003 and imports amounted 13 536 million euros.

Lorraine is also part of the "Great region"³⁸, which is composed of Luxembourg and the closest regions of Germany and Belgium (Saarland, Rhineland-Palatinate and Wallonia). The Great region established in 1997 an economic and social council in order to tackle common economic and social problems. The Great region has 11.2 million inhabitants and 120 000 cross-border workers.

3.1.4 The local financial market

In France, enterprises mainly rely on banks and banking loans to fund their activity. Financial markets are only a small source of financing. Nevertheless, numerous public and private organisations and associations provide enterprises with other possibilities to finance innovation. One of the main actors in France is OSEO. OSEO has regional nodes and works with SMEs.

The Regional Council is currently trying to organise the existing local financial tools available, to offer a more coherent product for enterprises. Regarding the creation and development of enterprises, there are different organisations providing entrepreneurs with equity without interest (or below the market rate) and without guarantees. The main actors are: Lorraine Entreprendre and the 15 local initiative platforms (PFILs), which are part of a national network of more than 260 platforms. The region also offers loan guarantees via the regional guarantee funds (together with OSEO sofaris).

Data on capital investment for 2005³⁹ show that Lorraine accounts for 0.7% of the total national amount of capital investment with 40 592 euros and 18 enterprises funded. In comparison, Île-de-France accounts for 65.4% of total investment with 4 million euros and 465 enterprises funded.

3.2 Policy context

The objective of enhancing the technological capabilities of companies has been maintained over the years since the 1990s. In the context of the State-Lorraine Contract Plan for the period 1994-1999, one objective was already to make SMEs aware of the importance of investment, and in particular of intangible investment.

3.2.1 Policy objectives

In the 1980s and 1990s, in order to reshape the industrial structure of the region, the Regional Council of Lorraine put the focus on support for SMEs. The point was to incite companies to drastically raise their technological standard. More recently, the Regional Council also emphasised the need to develop entrepreneurship. More specifically, the creation of new companies and assistance for the replacement of retiring chief executives are considered as major objectives (in particular through access to training and to human and technical assets). Concerning assistance for the replacement of retiring chief executives, the basic fact is that because of population ageing, 25 000 chief executives are due to retire in the next 10 years. The Regional Council has the objective of achieving 1 500 successful replacements per year, which would preserve about 6 to 7 000 jobs per year. Calls for proposals are open to support

³⁸ <http://www.grande-region.net/fr/index.html>.

³⁹ AFIC (2005), *Rapport sur l'activité du capital investissement en France*. http://www.afic.asso.fr/Images/Upload/DOCUMENTS/rapport_activite_CI_2005.pdf.

both sellers and buyers of companies, and in particular to provide them with external expertise to facilitate the handover. The idea is to take the opportunity of the replacement of these chief executives to enhance the technology capability of the companies they lead. This may be a good means of really increasing the R&D or even innovation activities of Lorraine's companies.

In order to support SMEs, in the 1990s, the Regional Council of Lorraine started to implement *ad hoc* structures aimed at closing the gap between the technology supply and needs of companies, especially SMEs. In order to reinforce the region's industry, the Regional Council designed several strategic priorities aimed at strengthening the existing sectors and at supporting the emergence of new activities (see Strategic Plan for Economic Development, 2004). One of the priorities is, again, linked to transfers from research to industry. In order to reinforce its support for innovation, the Regional Council implemented an Innovation Regional Fund for Lorraine, with a budget that amounted to 6 million euros in 2006.

3.2.2 Policy instruments

In the 1990s, several instruments were developed in Lorraine in order to help companies to enhance their technological standard. In particular, the focus was put on the dissemination of technologies based on materials and what is now called ICT. Incidentally, the effort was mostly made by the State, since 9.9 million euros out of 10.7 million were taken from the State budget.

Another instrument was created in the 1990s. It is related to the technology expertise and advisory services provided by external experts. In the mid-1990s, during the preparation of the State-Lorraine Plan Contract for 1994-1999, it was noted that 40% of SMEs already benefited from such services and that this number should be increased. To date, the impact of the use of external expertise on these activities is questionable, since the indicators on innovation for Lorraine remain relatively low. In 2002, P. Bourgoigne noted, as regards the R&D situation in Lorraine, that *"as a whole, the management of innovation by SMEs seems to be its weakest aspect. The integration of innovation faces more serious difficulties than just technical ones: financing, management, market approach, flexibility and human resources"*⁴⁰.

Regarding the instruments aimed at stimulating the economic development of the region, the Economic and Social Council of Lorraine⁴¹ underlined in 2006 that the Strategic Plan for Economic Development is actually not detailed enough. The main arguments are that the Regional Council insists on the need to increase actors' awareness of future economic transformations but does not identify operational tools to do so. The same applies as regards the need to anticipate difficulties faced by companies before they occur. On research, the Economic and Social Council noted the fact that increasing the attractiveness of the regional research infrastructure to foreign researchers, grant holders and students hinges on the improvement of housing infrastructures. In particular, the report stated that Lorraine could hardly claim an above average quality of life. For the Economic and Social Council, substantial efforts have to be made to improve the current state of affairs and help to attract people to Lorraine.

⁴⁰ Bourgoigne P. (2002), *Regional Innovation Strategies Exercises – The examples of two French regions: Lorraine and Auvergne*.

⁴¹ The Economic and Social Council is a consultative body reporting to the Regional Council.

Exhibit 2: Effects of policies complementary to RTD instruments on R&D capacity of the region

Policy areas	Policies complementary to RTD instruments affecting policy area*	Effects on R&D capacity of the region
Improving R&D governance	Increasing involvement of the regional research actors in the identification of research priorities	Improvement of the monitoring of research and innovation policies
Knowledge and technology transfer to enterprises	Implementation of <i>ad hoc</i> structures aimed at providing regional companies with research and innovation services	Innovation measures taken by the region have not significantly increased technology transfer
Research collaboration between public research organisations and the private sector	Support for Competitiveness Clusters and Local Productive Systems	These clusters have increased the number of joint research projects bringing together public and private actors
Supporting public research	Identification of thematic research priorities	Concentration of public funding (State, NUTS 2 region and NUTS 3 region) on thematic fields that the region is good at Increase in the overall coherence of instruments aimed at supporting research projects

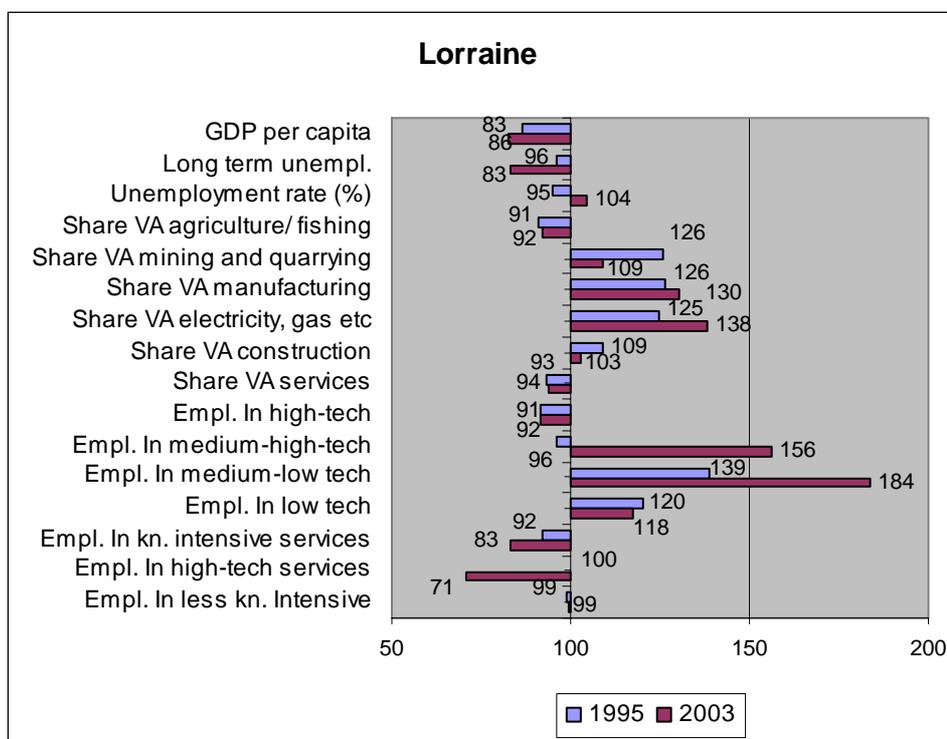
[*Examples of such policies are fiscal, industrial, regional, educational, labour, trade and competition policies.]

3.3 Conclusion

Since the 1980s, in Lorraine, the national and regional authorities have been pursuing the objective of restructuring industry. The first pillar has been to increase the innovative capabilities of regional companies in traditional sectors. As already mentioned, the Economic and Social Council noted, in 2006, that the Regional Council was somewhat over-optimistic when it endorsed the ambition that Lorraine should become one of the most innovative regions in France whereas the region suffers from very bad indicators with regard to innovation. From this point of view, the objective has not been fully achieved. Regarding research, it was mentioned that for decades, the Regional Council of Lorraine has been pushing companies to use more external expertise. In spite of an actual increase in the demand for such services by Lorraine companies, the effects on private R&D investments are questionable. To be more specific, private R&D investments in Lorraine are not following an upward trend.

The second pillar for restructuring Lorraine industry has been to develop new sectors. However, Lorraine still presents the characteristics of an economy based on traditional sectors, which represent a large share of value added and of employment. This has been reasserted in the current State-Lorraine Projects Contract (2007-2013), which notes: “Lorraine has gone from a mono-industrial economy to a diversified economy. In the space of three decades, employment in mining, the iron and steel industry and textiles collapsed dramatically. The sectors of automobiles, electrics and electronics, and plasturgy have only partially taken over the place of the traditional industries as far as employment is concerned”.

Summary Graph 2: Comparison of Lorraine's economic structure with the economic structure of France



Note: long term unemployment, unemployment rate and VA shares 2000, 2003

Low, medium-low and medium-high technology industrial sectors have a larger weight in Lorraine's economy than in the French economy. The percentages of employment in these sectors in Lorraine were higher than the national percentages respectively by 18%, 84% and 56% in 2002. On the other hand, high-technology sectors have a lower share in total employment in Lorraine in comparison with the situation in France (Lorraine's level was 92% that of France in 2002). The over-representation of the manufacturing industry and the under-representation of services go together in Lorraine. Hence, services have a smaller weight in the production of value added in Lorraine compared to that in France. Moreover, employment in the less knowledge intensive services as a percentage of total employment is almost the same in Lorraine as in France (99%), whereas the shares of employment as a percentage of total employment in knowledge intensive services and in high-technology services are rather weak (they correspond to 83% and 71% respectively of the national percentages).

4 Conclusions

4.1 Assessment of the RIS⁴²

Lorraine's research infrastructure is strongly dominated by the public sector and in particular by the higher education sector. Research specialisation of the region is in line with the region's industrial fabric (materials, mechanics, and chemical engineering) or can be applied to new sectors, such as chemistry, physics and biotechnologies. According to the French Statistical Office (INSEE), Lorraine's economy is not very dynamic even if it has a lower rate of unemployment than the national average⁴³. Private efforts in R&D are not sufficient and may explain why Lorraine's income per capita is lower than the national average.

Moreover, the R&D effort is concentrated on few sectors (the traditional ones, such as the iron and steel industry and metal processing) and is performed mostly by large companies. As a matter of fact, the use of research outcomes by regional actors does not reach the level it should. Public research is too far disconnected from the technological capabilities of private companies. This is, however, paradoxical insofar as Lorraine benefits from many interfaces and transfer bodies that cover a wide range and are interconnected in a regional and national network.

According to the Director of Studies at the Economic and Social Council of Lorraine⁴⁴, the situation is that public research laboratories in Lorraine are strongly engaged in research contracts, but partnerships are often created with companies outside Lorraine. This may be partly explained by the lack of opportunities in the regional economic environment. The result is that the economic growth of Lorraine continues to be supported by the traditional sectors, which are still characterised by an above-average level of R&D. Efforts made for decades to boost SMEs' technological capabilities do not seem to have strong effects on their R&D investments. The potential of innovating companies is not yet developed. Employment is mostly concentrated on low to medium technology intensive sectors. The creation of innovative companies, based on the regional R&D strengths, is definitely the best means to take advantage of the good regional knowledge base infrastructure. These new technology-based firms would enable Lorraine to catch up with the most innovative French and European regions and to create a virtuous circle. The innovative potential is not the issue.

⁴² This section is partly based on the Regional Innovation Strategies Exercise for Lorraine performed in 2002 (Bourgogne P. (2002), *Regional Innovation Strategies Exercises – The examples of two French regions: Lorraine and Auvergne*).

⁴³ INSEE (2006), *R&D en Lorraine*, February.

⁴⁴ INSEE (2006), *R&D en Lorraine*, February.

Exhibit 3: Strengths and weaknesses of the regional innovation system

	Strengths	Weaknesses
Knowledge creation capacity	<i>Thematic priorities were identified by the Regional Council that would avoid public resources being spread too thinly</i>	<i>R&D expenditures are rather weak. Lorraine did not catch up with the national levels. Research is mostly done by the public sector.</i>
Knowledge dissemination capacity	<i>Competitiveness Clusters may reinforce the linkages between creation and use of knowledge</i>	<i>R&D in Lorraine is mostly oriented towards basic research and not enough towards pre-competitive research. Management of innovation in SMEs is too weak.</i>
Knowledge absorption capacity		<i>The higher level of education is disconnected from the industrial fabric. In particular, SMEs have difficulties in hiring skilled employees (lack of highly qualified workers)</i>
Interactions between main actors	<i>Public actors are closely linked to each other There are many interfaces and transfer bodies that cover a wide range and are interconnected in a regional and national network</i>	<i>SMEs have difficulties either in being aware of their innovative needs or in identifying the right interlocutor</i>
RTD governance capacity	<i>All public actors were involved in the definition of the research priorities</i>	
Knowledge vs. economic specialisation	<i>Knowledge creation is coherent with the economic specialisation of the region</i>	<i>Industrial R&D is too heavily concentrated</i>
Economic structure	<i>The potential of innovating companies is considerable</i>	<i>Lorraine's economy is still based on traditional sectors. High-tech sectors are under-represented. Innovation is not sufficiently developed.</i>

4.2 Assessment of policies

Regarding governance of RTD policy, the Regional Council has regularly involved the main research actors, both private and public, in order to build a consensus on the thematic fields on which the region should focus. In 2005 and 2006, those actors were invited to participate in a large conference on higher education, research and innovation to share views on the regional knowledge base and identify regional priorities. From this point of view, choices were in line with the regional strengths and needs and remained coherent over time.

Given the fact that the traditional sectors are still playing a crucial role in the economy of Lorraine, the emphasis put on companies in these sectors by regional policies as well as national policies in Lorraine was and still is definitely relevant. That said, there are still problems to be overcome in the future to increase the innovative and economic position of the region. In July 2006, the Economic and Social Council of Lorraine published on its own initiative a critical report on the Regional Council's Strategic Plan for Economic Development⁴⁵. It underlined that the poor position of the region with regard to innovation was somewhat

⁴⁵ Economic and Social Council of Lorraine (2006), *Contribution to the Strategic Plan for Economic Development*.

underestimated. The report argued that the region does not suffer from a lack of technological centres: the problem is rather than the instruments are not sufficiently geared to the specific needs of the different types of companies. In particular, some SMEs have problems identifying the right public interlocutor they need while others are unable to identify their innovative needs themselves. For this reason, the report advocated a reinforcement of networking between technological actors. From this viewpoint, it can be said that the instruments for innovation and research may not necessarily match the objectives. Stronger efforts must be made to better connect the supply of technology and the demand for technology.

In terms of efforts, the support for economic development, including research and innovation, only takes a small share of the budget. To be more specific, the budget of the Regional Council for 2007 amounts to 869 million euros. The distribution of revenues by sources is as follows: 38.4% from regional taxes, 42.0% given by the State, 16.7% from loans and 2.9% from other sources. The regional actions represent 89.9% of the budget once the means for the functioning of the institution (5.7%) and the reimbursement of the debt (4.4%) have been deducted. The breakdown of regional actions by domains is as follows: 41.8% for training and education, 39.8% for mobility and spatial planning, 7.8% for social actions, 6.1% for economic development, 4.2% for innovation and 0.3% for European and cross-border actions. All in all, this means that 47.7 million euros⁴⁶ are devoted by the Regional Council to regional economic development, of which less than one half is based on taxation of regional actors and households and more than one half is based on taxation of national actors and households.

Exhibit 4: Public policy vs. strengths and weaknesses of RIS

<i>[S&Ws from Exhibit 3]</i>	Effective approaches <i>[only measures which appear to make a significant contribution to addressing the S&Ws are presented]</i>	Failures <i>[only measures which appear to have a significant negative effect or failed to address effectively the S&Ws]</i>
Strengths		
<i>Concentration of efforts on a few thematic fields</i>	<i>Lorraine public research is focused on a few thematic priorities corresponding to fields that the regional actors are good at</i>	<i>Research contracts with the private sector are not concluded often enough with the regional industrial actors.</i>
<i>Support for the emergence of new sectors</i>	<i>New economic activities have been emerging (chemistry, physics and biotechnologies)</i>	-
Weaknesses		
<i>Lorraine SMEs display poor indicators as regards innovation</i>	-	<i>The emphasis put on technology transfers was not able to increase private R&D investment nor to significantly enhance innovative capabilities of regional companies.</i>
<i>Lorraine private R&D expenditures are weak and are concentrated in large companies</i>	-	<i>Lorraine's SMEs have not changed their behaviour towards R&D</i>

⁴⁶ 869 x 89.9% x 6.1%.

4.3 Policy challenges

The main policy challenge of Lorraine is still linked to the restructuring of industry. Already in the 1980s, the State put the emphasis on the need to give a new impetus to Lorraine's economy. The point was to make companies in traditional sectors become more innovative.

When the regions were given more competences for economic development, the Regional Council of Lorraine also put this objective at the top of its priorities. Another point that was (and still is) to be overcome is the under-development of high-technology sectors, although the potential for such development exists. The right instruments to foster the technological development of tomorrow for Lorraine are certainly the two Competitiveness Clusters that have been set up. The cluster dedicated to fibres would enable a new economic activity to emerge based on the wood-paper-textile sectors. In parallel, the MIPI cluster would permit the competences of the materials sector to evolve towards new challenges.

That said, SMEs are not involved enough in the innovation system. On the one hand, R&D performed by the private sector is mostly the work of large companies. On the other hand, SMEs are not sufficiently aware of the need to be innovative, in particular in those low or medium-high technology sectors where competition is keen. It has been noted that SMEs are sometimes unable to identify their innovative needs, or when they are, have difficulties in identifying the institution that can provide them with the support/advice they need. This is paradoxical since it has been emphasised that Lorraine has many interfaces and transfer bodies. We noted that 25 000 chief executives are due to retire in the next 10 years. In order to permit successful replacement of retiring chief executives, the Regional Council will launch calls for proposals to support both sellers and buyers of companies, and in particular to provide them with external expertise to facilitate the handover. There is a real opportunity to make the renewal of a generation of managers in Lorraine's economy go hand-in-hand with a reinforcement of innovative practices in these companies.

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Annex 1: Definition of policy mix typology

- **Improving innovation and R&D governance capacity.** Technical assistance-type funding used by public authorities, regional agencies and public-private partnerships in developing and improving policies and strategies in support of R&D investments and innovation. This could include changes in the organisation of decision making, national and regional forecasting, measures for improving evaluation, etc.
- **Creating an innovation- and entrepreneur-friendly environment.** This category covers a wide range of actions which seek to improve the overall environment in which enterprises, universities and research organisations innovate. This includes the following measures:
 - Promoting an entrepreneurial and innovation culture in the private sector by undertaking awareness initiatives and changing regulations and disincentives that discourage entrepreneurship;
 - Regulations and initiatives addressing intellectual property rights either by improving legislation dealing with cases where the results of public or collaborative research are commercialised or by covering protection costs;
 - Direct or indirect support for spin-offs and new technology-based firms (NTBFs). Direct support includes public financial schemes such as pre-seed and first stage capital, while indirect measures include funding of incubators, training related to entrepreneurship, etc.
- **Developing human capital.** This category includes measures aimed at upgrading human resources in R&D and innovation-related activities, such as helping science and technology graduates to follow research and innovation-oriented careers; training researchers in enterprises or research centres; intra- and inter-national mobility of scientists; curriculum development in higher education aimed at developing science and technology; orientated under- and post-graduate courses, etc.
- **Networking, co-location and clustering measures.** Policies under this category focus on remedying deficiencies in innovation systems by promoting cooperation, networking and interaction. Measures promoting co-location of industrial and scientific organisations (e.g. innovation poles), funding for cluster infrastructure and technology- and innovation-oriented activities and support for innovation networking (e.g. information exchange clubs) are some of the possible measures in this category.
- **Knowledge and technology transfer to industry.** This category includes policies directly or indirectly supporting knowledge and technology transfer from universities and public research organisations and commercialisation of public research results. Direct support includes aid schemes for utilising technology-related services or for implementing projects transferring technology from the public or private sector to the private sector. Indirect policies include developing infrastructures facilitating technology transfer such as technology parks, innovation centres, university liaison and transfer offices.

- **Research cooperation between public research organisations and the private sector.** Measures supporting collaborative research projects and development of common research infrastructures (for use by private and public sector) are included.
- **Supporting public research.** Measures under this category include:
 - Public investments in research infrastructure and direct funding of public R&D, e.g. setting up new infrastructures or supporting centres of excellence;
 - Grants for R&D projects implemented in universities and other public research organisations;
 - Regulatory changes and incentives for universities and other public research organisations which encourage the commercialisation of research results and collaboration with industry.
- **Financial incentives for R&D in the private sector.** Two main categories of measures are included:
 - **Direct and indirect financial incentives for R&D in the private sector.** Direct measures include direct public funding of R&D in the private sector, e.g. grants, conditional loans. Indirect measures include tax incentives for firms to undertake R&D activities.
 - **Catalytic financial incentives for R&D in the private sector.** Includes instruments facilitating the access of R&D performers to external private-sector sources of finance. Typical measures of this type are measures encouraging the use of *risk capital* (e.g. venture capital funds) for both R&D and innovation-related activities and *loan and equity guarantee measures*.

Annex 2: Description of key indicators used in the summary graphs

Period of coverage: Two periods are used, i.e. 1995 and 2004 or the closest possible years

Index: Country=100

Source: Eurostat, 2006

Summary Graph 1: Key indicators of Lorraine's knowledge base development in comparison with France

1. Total in-house R&D expenditure as a percentage of GDP
 - GERD
 - BERD
 - GOVERD
 - HERD
 - PNPERD
2. R&D personnel as a percentage of total employment
 - All sectors
 - Business
 - Government
 - Higher education
 - Private non-profit
3. Human Resources in S&T as a percentage of labour force
4. Patent applications at EPO per million inhabitants
5. Students in tertiary education (ISCED 5+6) per thousand inhabitants.
6. Lifelong learning: participation of adults aged 25-64 in education and training as a percentage of population

Summary Graph 2: Key indicators of Lorraine's economic structure and development

1. GDP per capita at current market prices.
2. Long-term unemployment rate (in total unemployment).
3. Unemployment rate (%).
4. Value-added at basic prices (€ million): share (%) of sectors in total.
 - Agriculture/fisheries
 - Mining and quarrying
 - Manufacturing
 - Electricity, gas and water supply
 - Construction
 - Services (excl. extra-territorial organisations and bodies)
5. Annual data on employment in technology and knowledge-intensive sectors at regional level: percentage of total employment
 - High-technology manufacturing: NACE Rev. 1.1 codes 30, 32 and 33
 - Medium/high-technology manufacturing: NACE Rev. 1.1 codes 24, 29, 31, 34 and 35
 - Medium/low-technology: NACE Rev. 1.1 codes 23 and 25 to 28
 - Low technology: NACE Rev. 1.1 codes 15 to 22 and 36 to 37
 - Total knowledge-intensive services: NACE Rev. 1.1 codes 61, 62, 64 to 67, 70 to 74, 80, 85 and 92
 - Knowledge-intensive high-technology services: NACE Rev. 1.1 codes 64, 72, 73
 - Total less-knowledge-intensive services: NACE Rev. 1.1 codes 50, 51, 52, 55, 60, 63, 75, 90, 91, 93, 95 and 99
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Annex 3: Tables and Figures

Table 1: Universities in Lorraine

Name ⁴⁷	Number of students in 2005-2006 ⁴⁸	Of which in S&E fields	Doctorates awarded	Students in PhD programmes
Metz, UPV	15 851	NA	NA	614
Nancy 1- UHP	16 287	N/A	118 and 280 in medicine, pharma (2005)	941 (doctorate and post doc)
Nancy 2	17 996	0	N/A	N/A
INPL	4 000	4 000	N/A	N/A

Table 2: Universities in Lorraine - Research

Name	Academic staff (head count)	Number of research units	Research fields	Budget dedicated to research	Research contracts
Metz, UPV	486 teacher-researchers; 323 teachers	26	Maths, physics, chemistry, humanities, social sciences, engineering sciences, ICT, environmental sciences		80 projects totalling €1 700 000 since inception
Nancy 1- UHP	1 375 teacher-researchers	42	"Computer, Automatique, Electronique et Mathématiques Physique, Chimie de la Matière et des Matériaux Mécanique énergétique, Génie des Procédés Géosciences Chimie cell biology Biologie, Health"	1 400 teacher-researchers and 1 200 administrative staff	155 research contracts with industry per year
Nancy 2	717 teacher-researchers	N/A	N/A		N/A
INPL	560 teacher-researchers	28 research units	"Agronomics, Biotechnology, Géosciences et Génie civil (GGC); Pôle Informatique, Automatique, Électronique et Mathématiques (IAEM); Pôle Mécanique Énergie Génie des Procédés Chimie Innovation (MEPCI); Pôle Matériaux - Métallurgie (MM)"	160 researchers (together with CNRS INRIA INRA)	250 research contracts/year

⁴⁷ Metz UPV (Université Paul Verlaine), Nancy UHP (Université Henri Poincaré), INPL: Institut national polytechnique Lorrain.

⁴⁸ <http://media.education.gouv.fr/file/25/0/2250.pdf>.

Table 3: Total in-house R&D expenditure (GERD) by sectors of performance for Lorraine as percentage of France

Lorraine	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
All sectors	1.03%	1.01%	1.02%	1.09%	1.20%	1.13%	1.57%	1.55%	1.48%	1.53%	1.63%	1.54%	1.58%
Business enterprise sector	1.14%	1.11%	1.11%	1.21%	1.39%	1.27%	1.35%	1.30%	1.22%	1.18%	1.32%	1.13%	1.15%
Government sector	0.60%	0.60%	0.62%	0.65%	0.62%	0.64%	0.67%	0.70%	0.71%	0.82%	0.81%	0.92%	1.01%
Higher education sector	1.28%	1.29%	1.32%	1.30%	1.34%	1.30%	3.44%	3.45%	3.38%	3.49%	3.52%	3.57%	3.56%
Private non-profit sector	na												

Source: Eurostat

Table 4: Total in-house R&D expenditure (GERD) by sectors of performance

		1991	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
EU 25	All sectors	:	126164.9	131303.7	138368.78	145527.6	157524.98	169501.82	178808.34	186462.51	188681.31	194076.3
	Business enterprise sector	:	78797.61	82381.78	87583.35	92377.05	101847.52	109908.32	116194.54	119953.24	120991.07	124664.81
	Government sector	:	20709.79	21004.37	20826.14	21892.6	22469.86	23313.22	23451.84	24146.17	24478.08	24836.29
	Higher education sector	:	25788.44	27024.88	28985.44	30210.69	32048.75	34921.34	37626.19	40470.31	41223.65	42536.71
	Private non-profit sector	:	869.06	892.68	973.85	1047.25	1158.85	1358.94	1535.77	1892.79	1988.51	2038.5
France	All sectors	23387.509	27447.936	28119.367	27532.768	28138.856	29528.399	30953.6	32887.37	34527.117	34569.095	35648.104
	Business enterprise sector	14378.921	16738.05	17305.943	17217.469	17519.519	18655.125	19348.42	20782.15	21839	21646.182	22408.94
	Government sector	5297.6	5761.231	5699.397	5139.049	5245.282	5357.058	5361.43	5432.04	5709	5766.558	5956.288
	Higher education sector	3527.622	4585.369	4735.175	4794.712	4954.593	5067.863	5804.36	6217.29	6512.446	6692.93	6823.254
	Private non-profit sector	183.352	363.275	378.851	381.539	419.447	448.353	439.39	455.89	468	463.425	459.622
Lorraine	All sectors	240.909	329.667	317.86	432.199	434.787	436.06	474.94	537.15	531.198	546.504	:
	Business enterprise sector	164.049	232.653	219.638	232.953	227.047	226.66	228.03	274	245.846	249.928	:
	Government sector	31.831	35.709	36.489	34.511	36.715	38.14	44.07	44.23	52.649	58.037	:
	Higher education sector	45.029	61.305	61.744	164.736	171.025	171.26	202.84	218.92	232.702	238.54	:
	Private non-profit sector	:	:	:	:	:	:	:	:	:	:	:

Source: Eurostat

Table 5: Human resources in science and technology as percentage of active population

		1994	1995	2000	2001	2002	2003	2004	2005	2006
France	Human resources in S&T	31.1	30.7	33.7	34.9	35.9	36.7	37.1	38.3	38.3
	- Education	19.5	20.4	24	25.2	26.1	25.5	26	27.2	27.6
	- Occupation	26.3	23.9	25.1	26.1	26.4	27.7	27.4	28	27.7
	- Core	14.6	13.7	15.5	16.4	16.6	16.4	16.4	16.9	17.1
Lorraine	Human resources in S&T	24.4	24.8	29	30.6	30.8	30.1	29.5	33.5	30.1
	- Education	14.4	16.3	21	21.4	20.7	18.9	19.1	22.8	21.3
	- Occupation	21.7	21.1	22.3	23.7	23.4	23.3	22.1	24	22
	- Core	11.7	12.7	14.3	14.5	13.4	12.2	11.7	13.2	13.2

Source: Eurostat, Annual data on HRST and sub-groups (NUTS level 0, 1 and 2)

Table 6: Gross fixed capital formation (EUR million)/Compensation of employees (EUR million) 2003

	France	Lorraine	Difference
total All NACE branches Total	0.357040864	0.343913485	0.013127379
a_b Agriculture, hunting, forestry and fishing	1.286027327	1.658333333	-0.372306007
c_d_e Total industry (excluding construction)	0.255458363	0.359683099	-0.104224735
c_to_f Industry	0.222898132	0.305955679	-0.083057547
g_to_p Services (excluding extraterritorial organisations and bodies)	0.385724359	0.341632698	0.044091661
g_h_i Wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods; hotels and restaurants; transport, storage and communication	0.233240628	0.237200661	-0.003960033
j_k Financial intermediation; real estate, renting and business activities	0.790944055	0.948137536	-0.15719348
l_to_p Public administration and defence, compulsory social security; education; health and social work; other community, social and personal service activities; private households with employed persons	0.202031022	0.177596741	0.02443428

Source: Eurostat 2006, own calculations

Table 7: Number of local units (2004)

nace	France	Lorraine	France	Lorraine
c Mining and quarrying	4909	179	0.18%	0.26%
cb Mining and quarrying except energy producing materials	4688	170	0.17%	0.25%
cb14 Other mining and quarrying	4505	168	0.16%	0.25%
d Manufacturing	298057	9222	10.63%	13.63%
da Manufacture of food products; beverages and tobacco	77947	2603	2.78%	3.85%
da15 Manufacture of food products and beverages	77905	2600	2.78%	3.84%
db Manufacture of textiles and textile products	20776	392	0.74%	0.58%
db17 Manufacture of textiles	6306	209	0.22%	0.31%
dd Manufacture of wood and wood products	12108	522	0.43%	0.77%
de Manufacture of pulp, paper and paper products; publishing and printing	38628	763	1.38%	1.13%
de21 Manufacture of pulp, paper and paper products	2059	75	0.07%	0.11%
dh Manufacture of rubber and plastic products	6495	218	0.23%	0.32%
dh25 Manufacture of rubber and plastic products	6495	218	0.23%	0.32%
di Manufacture of other non-metallic mineral products	12408	472	0.44%	0.70%
di26 Manufacture of other non-metallic mineral products	12408	472	0.44%	0.70%
dj Manufacture of basic metals and fabricated metal products	35497	1411	1.27%	2.09%
dl Manufacture of electrical and optical equipment	23462	712	0.84%	1.05%
dm Manufacture of transport equipment	6431	161	0.23%	0.24%
dn Manufacturing n.e.c.	36431	1248	1.30%	1.84%
e Electricity, gas and water supply	13082	558	0.47%	0.82%
f Construction	320980	9385	11.45%	13.87%
g Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	860469	24690	30.69%	36.50%
g52 Retail trade, except of motor vehicles, motorcycles; repair of personal and household goods	533601	15814	19.03%	23.38%
h Hotels and restaurants	253443	6661	9.04%	9.85%
h55 Hotels and restaurants	253443	6661	9.04%	9.85%
i Transport, storage and communication	153966	4152	5.49%	6.14%
k Real estate, renting and business activities	645365	12803	23.02%	18.93%
Total	2803714	67650	100.00%	100.00%

Source: Eurostat

Table 8: Evolution of funding from the State and the region for State-Region Plan Contracts (total funding)

	CPER 1984-1988			CPER 1998-1993		
Source	State	Regional Council	Total	State	Regional Council	Total
Lorraine	466.19	159.92	626.11	496.21	290.89	787.1
%	74%	26%	100%	63%	37%	100%
Total	6383.1	4268.6	10651.6	8 626.9	6 938.1	15 565.0

	CPER 1994-1999			CPER 2000-2006		
Source	State	Regional Council	Total	State	Regional Council	Total
Lorraine	669.05	527.92	1196.97	816.88	681.46	1498.34
%	56%	44%	100%	55%	45%	100%
Total	11 790.6	10 843.5	22 634.1	16 650.2	16 946.0	33 596.17

Source : DIACT

Table 9: Distribution of Objective 2 funding in France and Lorraine (ECU million) (1989-1993)

	Business	Tourism	Infrastructure	Training	Environment	Technology	Other
Lorraine	34.32	27	120.25	21.1	8.12	0	0
France	173.88	86.93	411.91	268.53	99.25	58.14	10.82
%Lorraine/France	19.74%	31.06%	29.19%	7.86%	8.18%	0.00%	0.00%
Lorraine	16.28%	12.81%	57.05%	10.01%	3.85%	0.00%	0.00%

Source: Ernst & Young, Ex-Post Evaluation of the 1989-1993 Objective 2 programmes, Synthesis Report

Table 10: Objective 2, allocation of resources (EUR) 2000-2006

Programme	RTDI measures			Total		
	Total	ERDF	ESF	Total SF	ERDF	ESF
Obj. 2 Lorraine	2 253 600	2 253 600	None	393 702 667	353 394 902	40 307 765
Obj. 2 - Total Multi-regional Ops	473 105 359	459 740 389	13 364 970	6 494 231 462	5 673 568 944	820 662 518
% Lorraine/Total	0.5%	0.5%	-	6.1%	6.2%	4.9%
Lorraine RTDI measure/	0.6%	0.6%				

Source: Programming documents and financial data provided by DG REGIO in "Strategic Evaluation on Innovation and the Knowledge Based Economy in relation to the Structural and Cohesion Funds, for the programming period 2007-2013", European Commission, DG REGIO

Annex 4: RTD policies

Title of the measure or initiative: Conference for Higher Education, Research and Innovation organised in 2005.
Objectives: The Regional Council organised a Conference for Higher Education, Research and Innovation in 2005 and 2006 that enabled a consensus to be reached regarding the thematic fields on which the research policy should focus.
Policy area (<i>Taxonomy used in Exhibit 1</i>): Improving R&D governance
Main instruments and structure:
Main beneficiaries /target group: Research actors from both the public and the private sector. Private companies.
Achievements or failures (<i>why it is an example of good practice or a failure</i>): Following the broader competences as regards research given by the State to the regions in 2004, the Regional Council of Lorraine took this opportunity to better connect the research and technology supply from intermediate actors with regional needs. In order to identify these needs, the Regional Council held the Conference for Higher Education, Research and Innovation (2005). The consensus that emerged from this event is a positive development that bears witness to a common vision for Lorraine's research and innovation system. The participation of the actors in the Conference also shows the involvement of these actors in the regional economy.