Strategic Evaluation on Innovation and the knowledge based economy in relation to the Structural and Cohesion Funds, for the programming period 2007-2013

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Executive Summary

The Austrian innovation system has changed in the last decade at a pace and quality, that, from an outside view, the observer will perceive two different countries rather than one country, which has improved to the better. The most significant changes are first of all the steep increase of RTDI expenditures from 1.54% in 1995 to 1.78% in 1998 and to 2.35% in 2005. Major parts of this increase has been produced by the business sector and in particular Austrian branches of foreign-owned companies. Austria is popular as a location for R&D facilities mainly because it offers highly qualified scientists and engineers as well as proximity to universities and key customers.

The second pattern of change arises from a tremendous change in the policy culture and in the related institutional framework. Specifically, both at Federal as well as States' level, a process of 'agencification' took place. This process went hand in hand with the implementation of programmes as the most appropriate vehicle for policy delivery. Last, but not least, the establishment of the Austrian Council [Rat für Forschung und Technologieentwicklung], and the fusion of several specialised agencies to two major agencies (AWSG and FFG)) contributed much to completion of the institutional framework. Since then, explicit policy planning is an essential part of the overall policy culture. As regards to the relationship between the Austrian Council and the Federal States, things have not been settled so far, however, first steps have been done and further steps are under preparation. Particularly, the role of Structural Funds in future RTDI policy has not been high on the agenda in the past.

One of the most striking lessons which could be learned during the last few years is the increasing overload with policy measures as well as with policy actors. Further public investments in innovation and knowledge per se is no more justified, unless it is adjusted with autonomous States' and Federal strategies and measures. Furthermore, some States, respectively their economies have achieved a certain saturation with public support for RTDI.

In the past, a separation between SF planning and States and Federal policy planning could be observed throughout. Particularly, Federal RTDI policy (and, furthermore, deliberations on the 7th framework programme) and SF considerations are far from being conceived as mutually related. Future SF policy planning thus should be carried out by explicit and extensive reference to past, on-going and future policies, related measures, target groups, etc. at States' and Federal level in order to optimise the respective portfolio of policies and measures.

Furthermore, the institutions, responsible for planning and implementation of SF programmes should have the capability, to meet the respective requirements to perform policy planning and policy implementation. Particularly, they should have at least a workable relationship to the major federal agencies in charge of executing federal policy. Pragmatically, as a standard, the regional development agency of the respective States should be the first choice in the selection of the implementing body.

In the past, not the least through extensive involvement of stakeholders (which undoubtedly is a merit of its own right), SF programmes to a large extent have been

opportunity driven. Since stakeholders often are themselves public institutions, many of the policies and measures have turned out as supply dominated. Future SF planning should be based on thorough understanding of the problems and bottlenecks in the regional innovation system including possible shortcomings of the institutional framework. By referring to the overall portfolio of policies and measures, SF can contribute to assure a higher level of completeness and pertinence of the required actions. Particular emphasis should be put on reducing the number of measures and actions, which automatically supports the targeting at more 'systemic' issues.

It has been observed, that the political-administrative definition of policies and measures often does not meet the requirements of a given region as an economic / societal entity. Even more, within the political-administrative demarcation of 'eligible regions' are often too small and sometimes even arbitrary. A gradual improvement should and could be achieved through collaboration between States (which is already taking place, particularly and from good reasons, in cluster initiatives). However, it would be worthwhile to consider inter-state programmes as a constitutional entity of future SF policy. Even more, it could be worthwhile, to hand over some programmes to Federal agencies, particularly to the Austria Wirtschaftsservice Gesellschaft (AWSG) and the Forschungsförderungsgesellschaft (FFG). As a side effect, these two agencies could benefit from working with a regional focus. By doing so, a certain gap, which exists between the Federal agencies and the States' agencies, could be overcome. As regards to the observed smallness of 'eligible regions', a top-down approach, deriving and justifying policies from the characteristics and bottlenecks in the regional innovation systems will undoubtedly contribute to overcome this shortcoming. Specifically, it will be possible, where useful, to involve the respective 'centres'.

Projects are omnipresent, as they are the currency in the world of programmes. As a matter of fact, project appraisals often have a bias favouring the project (of its own right) rather than to assess the project in the light of the needs, requirements and capabilities of the respective organisation(s). Particular emphasis should thus be put on strengthening firms / organisations / institutions rather than on the delivery of projects. Accordingly, assessing the projects in the context of the capabilities and the wider context of the respective organisations should be the guideline for project appraisal rather than the quality of the projects on their own right. As a direct consequence of strengthening organisations, people will come to heart of measures.

In the past, both SF as well as well as Federal and States' policy have created a lot of institutions under the governance of the public sector. The most obvious examples, funded by SF money are incubator units, but also competence centres. Likewise, most of the regional development agencies are running units or providing services which could equally, even better performed on a private basis.

Since a great deal of agency-type institutions are positioned at the public-private interface, a should be carried out in order to identify candidates for privatisation. Incubators, some competence centres, but also parts of cluster initiatives or business advisory actions are promising candidates. Such a type of 'cleaning' can contribute to strengthen the business sector in terms of size and structure. At the same time it contributes to make agencies leaner, which should be high on the agenda at least for half of the States.

Austria has the best of everything. There is literally no need for further schemes and types of measures. Rather it will be necessary, (i) to clean up and reduce variety and number of measures and of organisations, and (ii) to reverse the mode of justification and thus turning supply-side dominance into orientation at the needs of the (regional) innovation system. The most dominant issue is thus promoting the **access** to existing resources in a wide sense (helping firm as partners for collaboration; to access remote research institutions looking out both for people and technological advice; funding opportunities; distribution channels, etc.). Again, the issue of strengthening the policy delivery capabilities (mainly of agencies) is more important than the question for the proper policy mix.

Future SF policy planning should put most emphasis on the availability and qualification of adequate policy supply capabilities. The first choice are here the respective agencies at State level. They have to be properly endowed with staff (need not be high in terms of number), access to networks (cannot be overestimated), a high degree of independence from government in the operational business (while having at the same time strong contractual and supervisory ties), and a highly developed culture to distinct between public and private. Having 'various' agencies is by no means acceptable (taking into account the fact, that an average Austrian State is smaller than 1 million inhabitants).

1 Introduction

In March 2000, the EU Heads of State and government launched an ambitious political initiative for the European Union to become "the most competitive, dynamic, knowledge-based economy by year 2010". The agenda, which has become known as the 'Lisbon Strategy', has included a broad range of policies and regulatory measures to achieve this goal.

At the 2005 Spring Council of European Union, Heads of State and government concluded that all appropriate national and Community resources, including those of Cohesion Policy, should be mobilised in order to renew the basis of Europe's competitiveness, increase its growth potential and its productivity and strengthen social cohesion, placing the main emphasis on knowledge, innovation and the optimisation of human capital. In short, the Council recognised that while some progress has been made since 2000 in moving towards the goals enshrined in the Lisbon Strategy there remains a need to create "a new partnership for growth and jobs"[1]

In launching the discussion on the priorities for the new generation of cohesion policy programmes, the Commission published on 6 July 2005 draft Community Strategic Guidelines entitled "Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013". One of the specific guideline is to improve the knowledge and innovation for growth. More specific areas of interventions, which are proposed by the Commission, include: improve and increase investment in RTD, facilitate innovation and promote entrepreneurship, promote the information society for all, and improve access to finance.[2]

Innovation is an important factor in releasing the potential of the Lisbon agenda. The knowledge captured in new technologies and processes can drive growth and competitiveness and create new jobs. But knowledge must be treated as part of a wider framework in which business grow and operate. Developing knowledge-based economy requires adequate levels of investment in R&D, education, and ICT as well as creating a favourable environment for innovation.

Less developed areas of the Union are also confronted with this new competitiveness challenge. Increasing cohesion leads to improvements in living standards and the reduction of economic and social disparities, which depend to an important extent on increases in productivity. Increasing competitiveness implies economic change through the introduction of new technologies and new methods of production as well as the development of new skills. Innovation is at the heart of this process. Technological and organisational change and new demands generated by rising income levels and factors which create new economic opportunities and therefore, contribute to the growth potential of these countries.

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[1] Communication to the Spring European Council (2005) "Working together for growth and jobs: A new start for the Lisbon Strategy", COM(2005) 141. Available at: http://www.europa.eu.int/growthandjobs/key/index_en.htm.

[2] Communication from the Commission (2005) "Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013", COM(2005) 0299. Available at: http://www.europa.eu.int/comm/regional_policy/sources/docoffic/2007/osc/index_en.htm.

Structural Funds are the main Community instruments to promote economic and social cohesion. In the past and current programmes, they have contributed to enhance the research potential and innovation in businesses and to develop the information society, particularly in the less developed areas. Cohesion policy has also promoted the development of regional innovation strategies and other similar initiatives in the field of the information society.

The overall objective of the strategic evaluation study, as set out in the terms of reference, is that the study should provide conclusions and recommendations for the future of Structural Fund and Cohesion policy. In particular, the Strategic Evaluation will be used to prepare the negotiations with the Member States for 2007-13, to prepare the next operational programmes and to provide input into the 4th Economic and Social Cohesion Report.

In line with the tender specifications, this country report addresses the following issues:

- An analysis of the current situation in the field of innovation and the knowledge-based economy at national and regional level. For the national level, performance is compared to the average performance for the EU25 Member States plus Romania and Bulgaria; and at regional level, where possible given available statistics, compared to a typology of EU regions;
- Lessons from the past and current experience of implementing innovation and knowledge economy measures in the Structural Funds, both in terms of priorities and strategic approaches; as well as in terms of operational implementation;
- Main needs and potential for innovation in the eligible regions drawing on available studies, strategy development and future and foresight studies; and
- Recommendations on main investment priorities for Structural Funds over the programming period 2007-2013 and their implications for regional development.

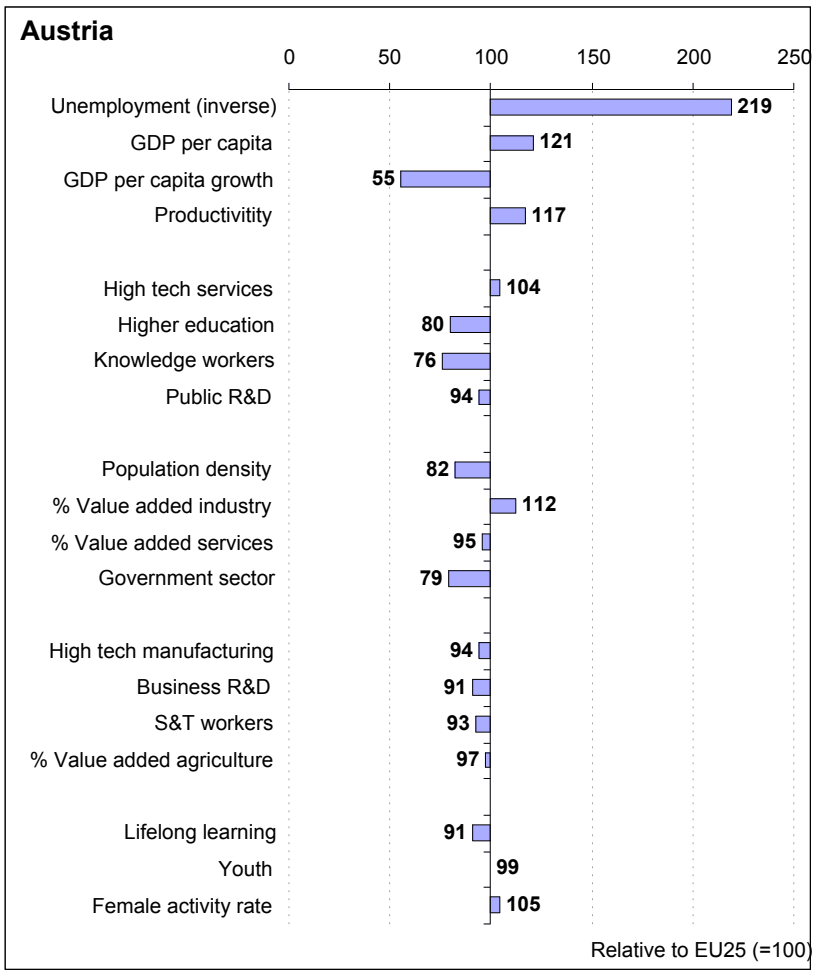
2 Investing in innovation and knowledge: a comparative overview of regional performance

This section provides a synthetic overview of the relative performance of the country, and where relevant main regions, with respect to the EU25 average for a number of selected key structural indicators of innovation and knowledge. The analysis aims to identify **main disparities and needs** at national, and wherever possible, regional level with a view to supporting the definition of priorities for future Structural Funds interventions (see sections 5 and 6 of this report).

2.1 Country overview: innovation and the knowledge economy

Exhibit 1 below provides a snapshot picture of the relative position of Austria compared to the EU-25 average for a series of key knowledge economy indicators.

Exhibit 1: Relative country performance for key knowledge economy indicators



Source: calculations of MERIT based on available Eurostat and national data from 2002-2003 depending on indicator. Detailed definitions and data for each indicator are provided in Appendix B..

Austria is amongst the richest countries in the EU-25. **GDP per capita** is 21% higher than the EU-25 average, however with a significantly slower growth rate (0.55 of EU-25 average during 1996-2002): **Unemployment rate** is comparatively low relative to EU-25 (by 2003): 4.2% vs. 9.2% in EU-25 average, thus lower by a factor 2.19, however with some regional variation (Vienna: 7.7%, Salzburg: 2.3%).

Austria exhibits a comparatively low **population density** (0.82 of EU-25 average). Its **regional landscape** is characterized by a pronounced variety of regions: a large proportion of alpine regions, rural areas with small density of population, industrial areas, urban centres (albeit small in international comparisons with the exception of the Vienna agglomeration where about one quarter of the population is living).

As regards to **productivity** (1.17 of EU-25 average by 2002), over a long period, the Austrian economy has benefited and is still benefiting from an efficient adoption of (imported) 'embodied' technological change. In recent years, however, a shift from this rather passive approach to a more active approach through direct investment in R&D has taken place. While in 1998 the share of **R&D expenditures of GDP** has been 1.78%, in 2005 the figure increased to 2.35%.[3] Actually, Austria has, over the past years, closed its former gap vis-à-vis Europe. In 1998, Austria still hovered below the EU-15 average, with some 4.8 researchers per 1,000 workers, but by 2002 the figure had climbed significantly to 6.1 researchers per 1,000 workers. In the corporate sector, the number of R&D personnel rose from 20,400 to 26,700 (FTE). This translates into a rise of 31% across the observation period or an average annual growth rate of 7%. It is remarkable that the growth is strongest in top-qualified scientific staff and highly qualified non-scientific staff.

R&D activities in the corporate sector have seen substantial growth. Between 1998 and 2002, Austrian enterprises considerably accelerated their R&D activities (cf. Exhibit 2). Both (i) spending on R&D and (ii) the number of companies active in R&D went up, a trend that prevailed in almost all sectors of the domestic economy. Such a decided surge in spending originated not just in a handful of high-tech sectors, but the medium- and low-tech segment similarly emitted strong growth signals. Especially satisfactory was the R&D spending allocated by the services sector.[4] However, there are some concerns, that the corporate sector has reached a certain saturation regarding the further adoption of public support.

High tech sectors are more or less performing at the level of EU-25 average: High-tech manufacturing (0.94), high-tech services (1.04). Interestingly, the increase of R&D in the corporate sector is not just originated in a handful of high-tech sectors, but the medium- and low-tech segment similarly emitted strong growth signals. Especially satisfactory was the R&D spending allocated by the services sector.[5] Same as in other countries, the high tech sector is responsible for the largest part of R&D spending in Austria. However, the increase in Austrian R&D spending was mostly due to sectors that the OECD categorises as medium-technology industries. Two

[3] Austrian Research and Technology Report 2005, Federal Ministry for Education, Science and Culture, Federal Ministry for Transport, Innovation and Technology, Federal Ministry of Economics and Labour, Vienna

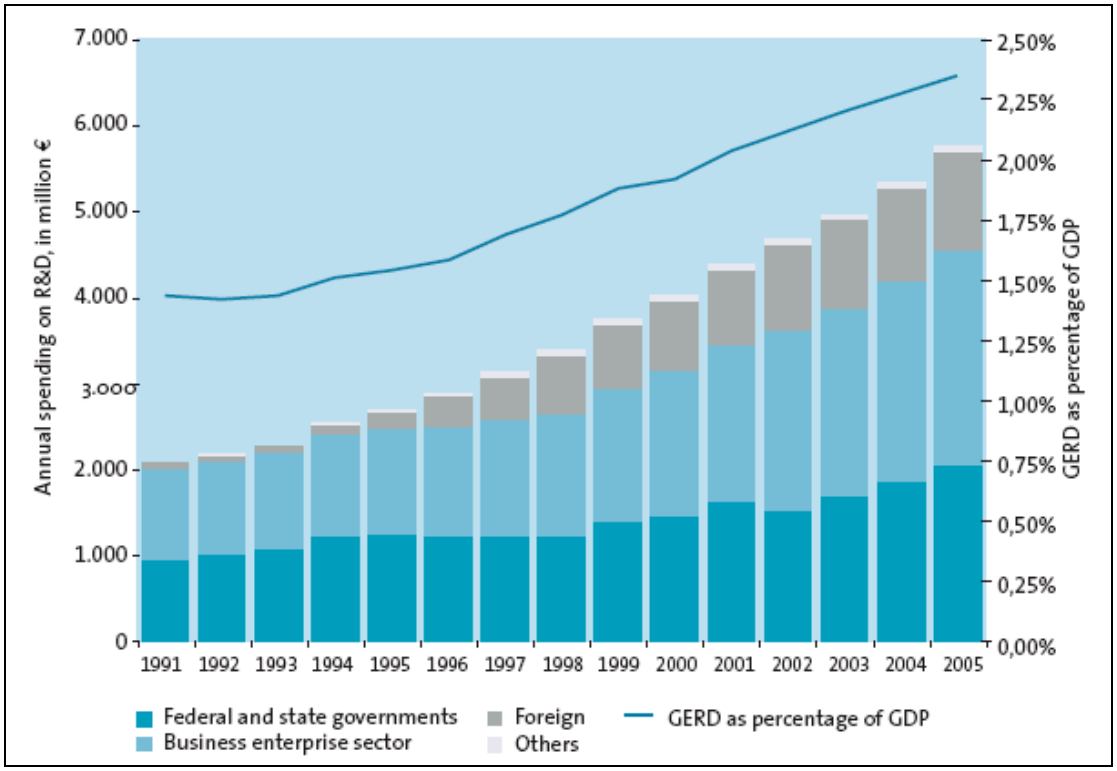
[4] Austrian Research and Technology Report 2005, op cit

[5] Austrian Research and Technology Report 2005, op cit

sectors performing particularly well are the automotive and machinery industries, with the latter almost doubling its expenditure.

Austria as a location for R&D facilities operated by foreign enterprises. In terms of patents held, foreign institutions (mostly companies) produce some 38% of the total R&D performed by the domestic business sector. At such a rate, Austria is amongst the most internationalised countries in the EU-15. With their R&D spending, foreign-owned companies located in Austria contribute substantially to the country's gross domestic expenditure on R&D. Austria is popular as a location for R&D facilities mainly because it offers highly qualified scientists and engineers as well as proximity to universities and key customers. Typical examples such as its successful biotechnology and IT clusters provide evidence of Austria's attraction, which is further fostered by a satisfactory tax situation and a number of soft location factors.[6]

Exhibit 2: Gross domestic expenditure on R&D (GERD) in Austria and R&D intensity, 1991–2005



Source: Statistik Austria

Public R&D. As Exhibit 2 clearly indicates, the amount of public spending increased over the period 1998-2005, however below the rate of GDP growth, and with a declining share, which currently amounts to 36.6%. At the same time, public policy has changed dramatically since 1998. The most decisive benchmarks are the implementation of competence centres programmes focusing at long-term, outcome-oriented institutionalised cooperative research between the public (academic) and the industrial sector, the allocation of extra funding ('Offensivprogramme'), an encouraged shift from project-based funding to programme-based funding, the reform of the university sector, and, not the least, the emergence of the Federal States as significant players in STI policy.

[6] Austrian Research and Technology Report 2005, op cit

Higher education, knowledge workers, S&T workers. Regarding these indicators, Austria still show shows a moderate performance. Austria has a low rate of academics (16.4%) compared to other countries. In 2003, Austria lagged by a good six percentage points behind the EU-15 average and by some 5 percentage points behind the EU-25 average. In a dynamic perspective, however, the proportion of working-age people with a tertiary education has almost doubled since 1998.[7]

Participation in life-long learning. Already in the late 1990s, Austria had achieved a rate of 9.1% of the 25-64 age group, a level that was above the EU-15 average. By 2003, this level could be increased to 12.5%, so that Austria has already attained the EU goal (getting 12.5% of the 25-64 age group to participate in life-long learning by 2010) and is thus clearly above the EU-15 average, which was 10.1% in 2003.[8]

Female activity rate. Slightly above EU-25 average. As regards to female scientists in the university sector, between 1998 and 2002, the total R&D personnel in the university sector went up by 14%, In 2002, women made up 38.3% (1998: 35.8 percent) of university research staff.

Things are different in the corporate sector. In 2002, 14.4% of S&I staff were women (3,837), higher by just one thousandth over 1998. Thus, the proportion of women had hardly changed at all. In corporate research, women are generally more frequently found at relatively low qualification levels. However, a specific change can be observed between 1998 and 2002 regarding the composition of qualification: While the overall share of female workers has remained unchanged, a favourable shift in the composition of qualification in corporate R&D took place, as the percentage of women at the medium and high qualification levels rose at a much brisker rate than that of men. It is a generally accepted fact that women do gain ground among the scientific and more highly qualified research staff. Yet the meagre increase (one thousandth) between 1998 and 2002 in no way reflects the labour potential nor the actual facts at the universities, where fully 37.1% of graduates in 2001 were women.

2.2 Regional disparities and recent trends

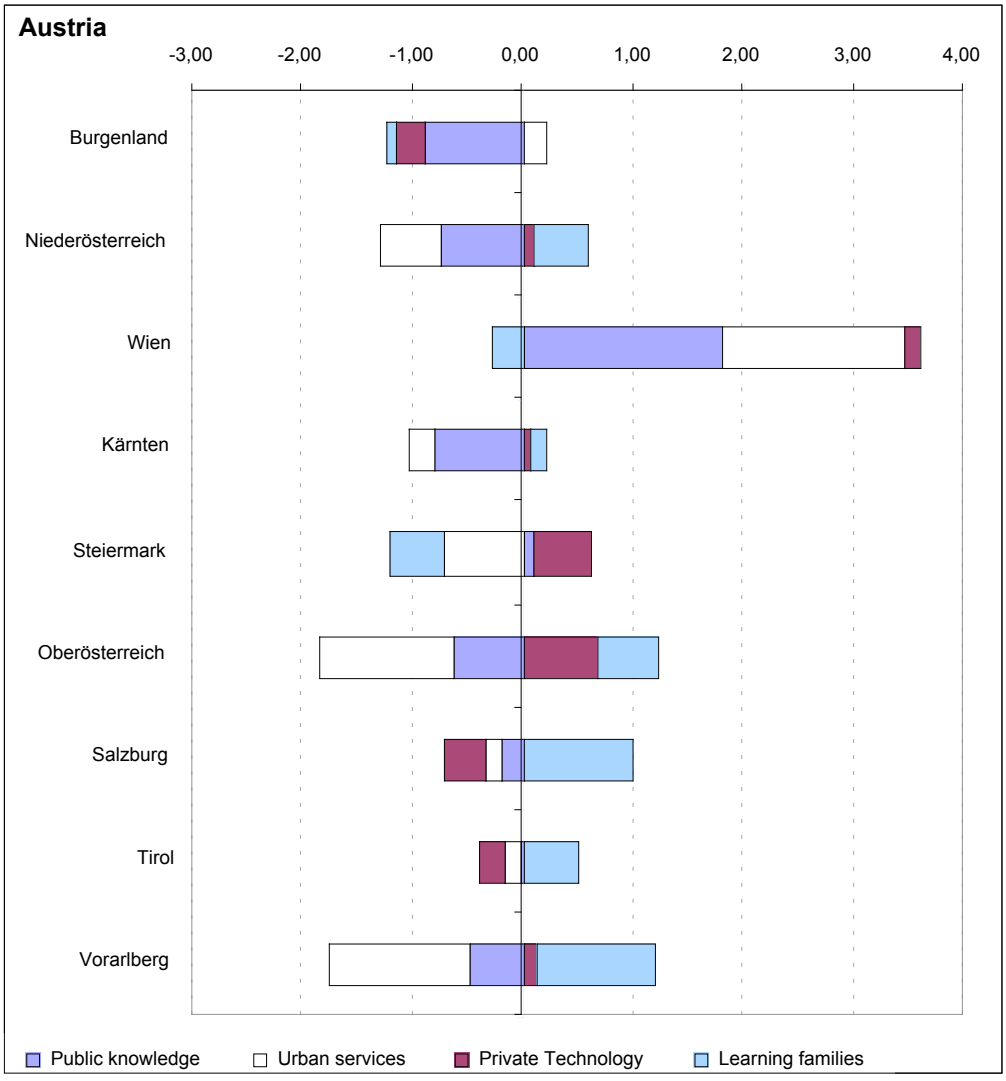
In order to analyse and describe the knowledge economies at regional level in the EU, the approach adopted was to reduce and condense all relevant statistical information available for a majority of regions. The approach involved firstly reducing the information from a list of selected variables into a small number of factors by means of factor analysis. These factors are:

- Public Knowledge (F1). Human resources in science and technology combined with public R&D expenditures and employment in knowledge intensive services is the most important or common variables in this factor. Regions with large universities will rank high on this factor.
- Urban Services (F2). The most important variables for this factor are value-added share of services, employment in government administrations and population density. A key observation is that academic centres do not necessary co-locate with administration centres.

[7] Austrian Research and Technology Report 2005, op cit
[8] Austrian Research and Technology Report 2005, op cit

- Private Technology (F3). This factor is most strongly influenced by business R&D, occupation in S&T activities, and employment in high- and medium-high-tech manufacturing industries.
- Learning Families (F4). The most important variable in this factor is the share of the population below the age of 10. The Learning Families factor could also be interpretated as an institutional factor indicating a child-, learning- and participation-friendly environment, or even a 'knowledge-society-life-style' based on behavioural norms and values that are beneficial to a knowledge economy.

Exhibit 3: Regional factor scores per region



Source: *MERIT. The bars are stapled factor-scores showing the deviation (1=standard deviation) per factor from the average of 215 EU regions (0.00). The longer the bar, the bigger is deviation. Detailed regional scorecards can be found in Appendix B.*

In a second step, the 200 plus EU27 regions were grouped into 11 types of regions (see appendix A) displaying similar characteristics by means of a cluster analysis. In the case of Austria the regions are grouped as follows:

- **Burgenland** stands for the least developed region in Austria. It has been classified as Objective 1 region over two planning periods. At current state of affairs, Burgenland exhibits a sharp increase in GDP per capita (192% relative to Austria), however at a still low level of 67% of national average. The dominating sector is still the agricultural sector (value added in agriculture: 281%), followed by the Government sector (163%), industrial sector is around national average (value added in industry: 100%, in services: 95%). The indicators, directing at future dynamics, are significantly below national average: Productivity (70%), high-tech services (88%), higher education (75%), knowledge workers (73%), high-tech manufacturing (70%), business R&D (12%). Lifelong learning (74%), youth (88%) and female activity rate (92%) are below average. As regards to the classification of 11 types of EU regions, there is some similarity with the 'Central Techno' cluster.
- **Niederösterreich**. This state is not unlike Burgenland: Relatively high growth rates in GDP per capita (138%) and a high value added in agriculture (199%). On the other hand, quite a lot of indicators are significantly below national average: Productivity (80%), high-tech services (93%), higher education (85%), knowledge workers (77%), public R&D (8%), business R&D (54%). Lifelong learning (104%), youth (99%) and female activity rate (99%) are at average. As regards to the classification of 11 types of EU regions, there is some similarity with the 'Central Techno' cluster. Generally, a strong caveat has to be made with respect to the notion of Niederösterreich as an economic and societal region, as it suffers to a large extent from the fact, that the definition of regions is determined by constitution, insofar, as the Capital Vienna, in geographical and economic terms, is a part of Niederösterreich and vice versa, but considered as a separate region. Thus, all characterisations of Niederösterreich as a region is to a high extent artificial.
- **Wien**. The Nation's capital clearly shows the profile of a 'Science and Service Centre'. High GDP per capita (143%), high GDP per capita growth (132%), high productivity (144%), high share of high tech services (189%), and generally of services (value added services: 122%). On the other hand low share of industry (value added in industry: 56%) and in high tech manufacturing (72%). Regarding characteristics, indicating future performance, most of them are quite above national average: Higher education (130%), knowledge workers (139%), public R&D (208%), business R&D (158%), and S&T workers (126%). Lifelong learning (105%) and female activity rate (104%) are slightly above average, youth activity rate is below (92%). High unemployment rate (55%, inverse).
- **Kärnten**. This southern State is classified as having the closest similarity to the 'Central Techno' cluster. Moderate unemployment rate (127%, inverse), low GDP per capita (83%), but above average GDP growth per capita (135%), low productivity (86%). Slightly above or at national average in value added in industry (108%), value added in services (95%), high tech manufacturing (97%), strong in agriculture (value added in agriculture: 158%). Low indicators in learning economy: High tech services (63%), higher education (88%), knowledge workers (79%), public R&D (32%), business R&D (78%), S&T workers (83%), lifelong learning (83%).
- **Steiermark**. This south-eastern State differs in some regards from other Federal States. While GDP per capita is below national average (85%), GDP per capita growth is quite impressive (158%). Although famous from the research-based

industry in the Graz area and the Automotive cluster, productivity is significantly below national average (87%). There is some above average high tech manufacturing (110%), a comparatively strong presence of industry (Value added in industry: 120%), particularly agriculture (Value added in agriculture: 150%). As regard to future investments, public R&D (154%) and business R&D (135%) are quite high. At the same time scores in high tech services (89%), higher education (93%), share of knowledge workers (92%) and S&T workers (89%) are below average. Likewise, lifelong learning (74%), youth (94%) and female activity rate (95%) score low. Steiermark is classified as 'Central Techno', however, a more detailed view reveals a certain heterogeneity throughout the State, particularly with respect to a strong research-based industry in the Graz area.

- **Oberösterreich**. This State shows a slightly below average GDP per capita (93%), combined with an impressive growth rate (152%). Strong industry sector in terms of volume (value added industry: 138%) and specialisation (high tech manufacturing: 146%), as well as above average agriculture (value added agriculture: 119%), significantly below average service sector (value added services: 82%), government sector (92%), poor in High tech services (72%). Dynamic indicators are below average: Productivity (92%), higher education (95%), knowledge workers (97%), public R&D (31%), business R&D (98%), S&T workers (97%). Above average scores in lifelong learning (107%), youth (107%) and female activity rate (103%). Generally, Oberösterreich is scored as a 'Learning region', indicating an above average in lifelong learning, youth, and female activity rate, some specialisation in advanced sectors and future investments.
- **Salzburg**. This central region shows a quite encouraging unemployment rate (183%, inverse), above average GDP per capita (111%) with a healthy growth rate (128%). Productivity scores above average (105%), production is dominated by the service sector (value added services: 105%), but below average in industry (value added: 90%), and in agriculture (value added: 62%), government sector is rather lean (84%). As regards to indicators, relevant for long-term development, the prospects are somewhat mixed, as most of them are below national average: High tech services (84%), high tech manufacturing (82%), knowledge workers (96%), public R&D (55%), business R&D (27%), S&T workers (96%). On the other hand higher education (103%), lifelong learning (127%), youth (107%) and female activity rate (109%) are above average. All in all, Salzburg is classified as a 'Learning region'. However, it is important, to note, that Salzburg, not unlike other States / regions, internally differs considerably between the centre (the City of Salzburg) and the rural areas.
- **Tirol**. GDP per capita is at national average (103%), however unemployment rate (168%, inverse) and GDP per capita growth (155%) are impressive. Productivity is at national level (102%), value added is created slightly below in industry (94%), and slightly above in services (104%), considerably below in agriculture (71%), and in the government sector (76%). Factors, indicating future development are mixed, but generally indicating a certain weakness in the business sector: High tech services (58%), high tech manufacturing (77%), public R&D (131%), business R&D (69%), knowledge workers (103%), S&T workers (99%), higher education (100%), lifelong learning (100%), female activity rate (101%). Youth activity rate is high (110%). The State of Tirol is classified as a 'Learning region' indicating a certain share of rather unexploited potentials.

- **Vorarlberg**. The most westerly State shows an average unemployment rate (105%, inverse), a GDP per capita (104%) at average level, but a quite strong growth rate (152%). Productivity is at national level (103%). The regional economy is strongly determined by industry (value added industry: 134%), less so from services (value added services: 86%), and agriculture (value added agriculture: 42%); the government sector is lean (64%). The established economic structure is to a certain extent mirrored in the 'High-tech-end': High tech manufacturing (110%), high tech services (58%). While both public (5%) and business R&D expenditures (77%) are quite low, the share of higher education (106%), knowledge workers (109%) and even S&T workers (96%), but in particular lifelong learning (124%) and youth activity rate (116%) are quite satisfactory. Vorarlberg is classified as 'Learning region'.

Exhibit 4 provides a view at recent trends of key indicators for selected Austrian regions in the period 1996-2002(3). Additional insights can be derived: A rather even and positive rate of growth of GDP per capita throughout the regions, general increase in tertiary education, on the one hand. On the other hand, uneven trends in unemployment rates, general decline of industry and agriculture share.

Exhibit 4: Recent trends per region in key indicators

		Unemployment	Per capita GDP	Industry share	Agriculture share	Population density	Tertiary education
		1996-2003	1996-2002	1996-2002	1996-2002	1996-2002	1999-2002
		%-pnt ch.	% growth	%-pnt ch.	%-pnt ch.	% growth	%-pnt ch.
EU25		--	--	--	--	--	--
Austria		-0,20	3,76	-0,06	-0,40	1,16	2,64
Burgenland	AT11	0,80	5,03	-0,58	-0,81	-0,14	2,53
Niederösterreich	AT12	0,00	3,62	0,74	-0,94	1,76	1,71
Wien	AT13	2,00	3,46	-2,45	-0,03	0,67	1,90
Kärnten	AT21	-2,50	3,53	-0,54	-0,06	-0,51	4,09
Steiermark	AT22	-1,00	4,13	2,12	-0,74	-0,14	2,63
Oberösterreich	AT31	0,20	3,98	0,64	-0,61	1,41	3,10

Source : MERIT based on Eurostat data for period indicated

2.3 Conclusions: Innovation and knowledge performance

What are the implications in terms of regional needs and disparities of the regional factor analysis? Exhibit 5 provides a rather coherent system of regions amongst the Austrian economy. Of the nine regions, one is the Nation's capital, Vienna, is hosting a large share of service and science institutions. On the other hand, four States (Burgenland, Niederösterreich, Kärnten, and Steiermark) are classified as Central Techno Regions[9]. The remaining four are considered as 'Learning' regions[10]. This

[9] "This is a rather large group of regions located mostly in Germany and France with close to average characteristic, but the share of High-tech manufacturing is rather high. The factor-scores as well as GDP-per head is slightly above the regional average, except for the Public Knowledge factor which is slightly lower." Cf. Annex A for details.

[10] "The Learning regions are first of all characterised by the high score on the factor 'Learning Families', and the three main components of this factor: life-long-learning, youth and female activity rate. On the other factors the regions are close to the regional average. Unemployment is on average the lowest compared to the other EU regions. Employment in the government sector is limited. GDP per capita is rather high. The regions are located in Austria, Ireland, the Netherlands, Sweden and the UK. There are many similarities with the Nordic High-tech Learning regions, but the business sector in the Nordic version invest more in R&D." Cf. Annex A for details.

classification suggests a rather uniform policy approach in terms of needs and instrumentation. However, a more detailed view[11], reveals strong differences even within one single region / State, which makes it difficult, to design and implement powerful policies. On the other hand, apart from attempts to aggregate regional characteristics at a high level, a closer view at the specific characteristics of the respective regions, provides a lot of indications for a more focused policy design. A promising approach is here the identification of unexploited opportunities and resources vis-à-vis gaps, for instance (non-)availability of knowledge workers vis-à-vis value added in industry, high vs. low share of public R&D vs. share of industry, etc..

Exhibit 5: Classification of Austrian regions by cluster

	B	NÖ	W	K	ST	OÖ	S	T	V
Learning						x	x	x	x
Central Techno	x	x		x	x				
Local Science & Services									
High Techno									
Aging Academia									
Southern Cohesion									
Eastern Cohesion									
Rural Industries									
Low-tech Government									
Nordic High-tech Learning									
Science & Service Centre			x						

Exhibit 6: Summary of key disparities and needs per region

Region	Key factors explaining disparity of performance (weaknesses)	Key needs in terms of innovation and the knowledge economy
Burgenland	▪ high share of agricultural production ▪ poor endowment with industrial production and with high-tech industry ▪ poor labour market for high-tech, high-skill personnel ▪ Burgenland as a region is to a high extent a statistical artefact	▪ trans-boarder cooperation in **any** regard, particularly of regional policy making by a stronger inclusion of neighbouring regions, particularly Wien and Steiermark, but also Western Hungary ▪ cooperation in policy making, particularly linking innovation policy with educational and labour market policy and agriculture policy
Kärnten	▪ Kärnten has some 'hot spots' in the central area (Klagenfurt, Villach) ▪ a series of unexploited resources (productivity improvement) and opportunities, mainly due to the politically determined demarcation of regions, thus excluding e.g. Eastern Tyrol, parts of Steiermark	▪ open the policy arena, both cross-border as well as between different policy areas (innovation, education, labour market) ▪ direct policy measures more directly at the weaknesses and strengths rather than focus at supply side policies (esp. in supporting science based industries)
Niederösterreich	▪ strengths in agriculture, esp. viticulture ▪ unexploited opportunities from the Capital Vienna both in economic terms as well as in policy making ▪ both as a strength and a weakness:	▪ orient policy more at the specific needs and opportunities of the industry (instead of research based industry) ▪ (continue to) cooperate with the Vienna region

[11] The mid-term-reviews of the Structural Funds serve as a particular source.

Region	Key factors explaining disparity of performance (weaknesses)	Key needs in terms of innovation and the knowledge economy
	high share of traditional sectors (medium technology), poor specialisation	▪ more integrated policy approaches (within State as well a with national / EU level)
Oberösterreich	▪ strong industrial sector ▪ underdeveloped (public) research sector, however growing ▪ strong long-term basis (life long learning, youth and female activity rate) ▪ coherent policy (with some centrifugal forces in the recent past)	▪ regain lost ground in own policy making, specifically avoid politicization of innovation policy ▪ continue to collaborate in policy-making (national and EU) ▪ link research and innovation policy with education and labour market policy
Salzburg	▪ both as a strength and weakness: no clear profile regarding industry, services, agriculture ▪ relatively weak performance in the high-end sectors ▪ strong long-term basis (life long learning, youth and female activity rate) ▪ stress between the City of Salzburg area and the 'inner districts'	▪ improve and intensify integrated policy making (primarily within regional policy making) ▪ be more clear about policy measures aiming at the City of Salzburg area and those at the 'inner districts' (= alpine districts) ▪ as regards to the inner districts, open the scope, particularly link policy approaches with those oriented at the centre region
Steiermark	▪ a strong public research-base in general ▪ a strong research-based industry in the Graz area ▪ high visibility and performance of the automotive cluster ▪ (surprisingly) moderate overall endowment with high-end sectors	▪ continue with average policy making (intensity of STI policy attention, collaboration (within State, but in particular with national and EU level) ▪ put more effort at those areas and sectors, which are less visible
Tirol	▪ a strong science base (focused at the Capital Innsbruck) as well as a handful of big firms ▪ poor endowment with innovative capacities apart from theses centres ▪ coherent policy making, however a certain gap between high-end areas and more traditional regional policy	▪ address more systematically the research-based sector, particularly with respect to the creation of any sort of spill-overs (of economic relevance in the region) ▪ link STI policy more systematically to the few existing gaps (regional policy, labour market policy)
Vorarlberg	▪ Vorarlberg exhibits a strong industrial base ▪ quite high endowment of future potentials: life long learning, youth and female activity rate, knowledge workers ▪ cultural strengths in a high pragmatism	▪ (continue to) develop the industrial sector, particularly by improving the research and labour market base ▪ (continue to) rely on people ▪ (continue to) being pragmatic in policy making
Wien	▪ over the years (and even decades) Wien has been quite successful to develop a visible and increasingly performing research-based industry (ICT, life sciences) with a de facto strength at services rather than in industrial production ▪ policy making has achieved high standards, however with a (still) high degree of internal orientation	▪ open policy orientation beyond the political borders (particularly including Niederösterreich and Burgenland, which is more difficult than including Moravia, Slovakia, or Hungary ▪ (continue to) increase attention to the service sector

3 Innovation and knowledge: institutional context and policy mix at national and regional levels

Structural Fund support for innovation and knowledge is contingent on and seeks to generate strengthen the existing national (and/or regional) innovation system[12] in each Member State. In particular, institutional, legal and financial factors in the innovation system can limit the potential for certain types of intervention. Moreover, within the framework of the EU's "Lisbon objectives", Structural Fund interventions are expected to complement and provide added value to national (or regional) policy framework. In some Member States, Structural Fund interventions in favour of innovation and knowledge are marginal with respect to the national investment and policy effort, in others Structural Funds provide a main source of funding for such interventions. In both cases, there is a need to identify relevant national and EU policies which can have an impact on decisions on funding priorities.

3.1 Institutional and legal framework for innovation and the knowledge economy

This section of the report appraises two broad factors that condition the potential for coordinated intervention of EU and national (regional) policies in favour of innovation and knowledge:

- The first concerns the organisational structures of public and semi-public bodies responsible for the design, implementation and monitoring of innovation and knowledge economy policies. In particular, the analysis considers the responsibilities for funding or managing specific types of measures liable to be considered for support under the Structural Funds;
- The second concerns the institutional, legal and financial frameworks, which condition the linkage of national (regional) financing with EU financing.

[12] The network of organisations, individuals and institutions, located within or active within national or regional boundaries, that determine and shape the generation, diffusion and use of technology and other knowledge, which, in turn, explain the pattern, pace and rate of innovation and the economic success of innovation.

Exhibit 7: Regional / economic development agencies and related policy areas at Federal and State level by policy areas

Federal state	Agency / Government body	Improving governance of innovation and knowledge policies	Innovation friendly environment	Knowledge transfer and technology diffusion to enterprises	Innovation poles and clusters	Support to creation and growth of innovative enterprises	Boosting applied research and product development	Investment in basic research capacities
Burgenland	Amt der Burgenländischen Landesregierung, Stabsstelle Europabüro und Statistik	(SF)						
	Wirtschaftsservice Burgenland Aktiengesellschaft (WIBAG)		x	x	x	x	x	
Kärnten	Kärntner Wirtschafts-förderungsfond (KWF)	(SF)	x	x	x	x	x	x
	Kärntner Betriebsansiedlungs- und Beteiligungsgesellschaft (BABEG)							
	Entwicklungsagentur Kärnten (EAK)		x	x	x	x		
Nieder-österreich	Amt der NÖ Landesregierung, Abteilung RU2, Raumordnung und Regionalpolitik	x						
	Amt der NÖ Landesregierung, Abteilung Wirtschaft und Tourismus	x	x	x		x	x	
	ecoplus	x	x	x	x	x	x	
	TecNet Capital					x	x	x
	Regionales Innovationszentrum (RIZ)				x	x		
Ober-österreich	Amt der OÖ Landesregierung, Abteilung Gewerbe, Wirtschaftspolitik	(SF)						x
	OÖ Technologie Marketing Gesellschaft (TMG)	x	x	x	x	x	x	x
	OÖ Clusterland Gesellschaft							
Salzburg	Amt der Salzburger Landes-regierung, Abteilung 15	(SF)					x	x
	Innovations- und Technologie-transfer Gesellschaft (ITG)		x	x	x	x	x	
	SalzburgAgentur		x		x			
Steiermark	Amt der Steiermärkischen Landesregierung, Abteilung 14, Wirtschaft und Arbeit	(SF)						
	Steirische Wirtschaftsförderungs-	x	x	x	x	x	x	

Federal state	Agency / Government body	Improving governance of innovation and knowledge policies	Innovation friendly environment	Knowledge transfer and technology diffusion to enterprises	Innovation poles and clusters	Support to creation and growth of innovative enterprises	Boosting applied research and product development	Investment in basic research capacities
	gesellschaft (SFG)							
	Amt der Steiermärkischen Landesregierung, Abteilung Wissenschaft und Forschung	x					x	x
Tirol	Amt der Tiroler Landesregierung, Abteilung Raumordnung-Statistik	(SF)						
	Amt der Tiroler Landesregierung, Abteilung Wirtschaft und Arbeit	x	x	x				x
	Tiroler Zukunftsstiftung (TZS)	x	x	x	x	x	x	x
Vorarlberg	Amt der Vorarlberger Landesregierung, Abt. Europaangelegenheiten und Außenbeziehungen	(SF)						
	Amt der Vorarlberger Landesregierung, Abteilung für Allgemeine Wirtschaftsangelegenheiten	x		x			x	
	Amt der Vorarlberger Landesregierung, Abteilung Wissenschaft und Weiterbildung	x					x	x
	Wirtschafts-Standort Vorarlberg GmbH (WISTO)	x	x	x	x	x	x	
Wien	Amt der Wiener Landesregierung, MA EU-Förderungen	(SF)						
	Wiener Wirtschaftsförderungsfonds (WWFF)	x	x	x	x	x		
	Zentrum für Innovation und Technologie (ZIT)	x	x	x	x	x	x	x
	Wiener Wissenschafts-, Forschungs- und Technologiefonds (WWTF)	x						x
Federal Level	Forschungsförderungsgesellschaft (FFG)							
	Austria Wirtschaftsservice Gesellschaft (AWSG)	x	x	x		x	x	
	Fonds zur Förderung der wissenschaftliche Forschung (FWF)	x	x					x
	Bundesministerium für Verkehr, Innovation und Technologie	x	x					

Federal state	Agency / Government body	Improving governance of innovation and knowledge policies	Innovation friendly environment	Knowledge transfer and technology diffusion to enterprises	Innovation poles and clusters	Support to creation and growth of innovative enterprises	Boosting applied research and product development	Investment in basic research capacities
	Bundesministerium für Wirtschaft und Arbeit	x	x					
	Bundesministerium für Bildung, Wissenschaft und Kultur	x	x					
	Rat für Forschung und Technologieentwicklung (RFT)	x						
	Österreichische Raumordnungskonferenz	Monitoring body to SF						

Source: Study team based on national/regional policy documents, TrendChart reports, OECD reports, etc.. See appendix C for a detailed definition of the policy categories.

There are some remarkable characteristics in the Austrian system of policy making and policy implementation. One can be directly derived from Exhibit 7, which indicates a strong overlap both in the formulation of policies as well as in their implementation. This has mainly to do with a extraordinary dynamics during the last decade in the policy arena both at the federal as well as state level.

In fact, there is no Archimedean point in the system, which would allow some central steering (apart from the question, whether this is a desirable goal). The Austrian Council (Rat für Forschung und Technologieentwicklung), implemented in 2000, was indeed conceived as such an Archimedean point. However, they quickly turned into a would-be super-ministry, mainly oriented at recommending funding schemes and advising the Federal Government regarding the allocation of federal money.

At federal level, the consolidation of a larger number of public, semi-public, and private actors, dealing with policy formulation and policy implementation in the last four years, resulting in the foundation of the Austria Wirtschaftsservice Gesellschaft (AWSG) and the Forschungsförderungsgesellschaft (FFG) contributed much to a more coherent policy acting at Federal level.

The States are often moving into two opposite directions: While on the one hand they aim at a consolidation of institutions, the institutions themselves are quite active in 'breeding' new sub-agencies and other intermediate organisations. The landscape can thus rather conceived as a **'mosaic on the move'** (with too many stones necessary to complete the picture!).

Regarding the question whether some policy elements are missing, the answer is a definitive: No!

Regarding the related question, whether Community funds can contribute to an improvement of the policy system (institutions, programmes, instruments, services, etc.), here the answer is a restrained Yes! The European Commission should have a keen interest in understanding the **portfolio** of related policies and actions at the level of the States, particularly at the level of the involved agencies and government units rather than creating new support schemes, whatsoever. What should be avoided is to create overlaps and overloads and thus similar policy actions, which, time and again, has created a hunting for beneficiaries in the past.

3.2 Policy mix assessment

This section provides a summary overview and analysis of the national and regional policy mix in favour of innovation and knowledge in which the Structural Fund interventions take place. The analysis is conducted with respect to seven broad categories of objectives of innovation and knowledge policies (see appendix C for an explanation of each category).

Measures identified per category of the policy objectives are then further sub-divided in terms of the direct beneficiaries of funding (or legislative) action. To simplify, the report adopts three broad types of organisation as targets of policy intervention:

- Policies supporting academic and non-profit knowledge creating institutions;
- Policies supporting intermediary/bridging organisations involved in innovation support, technology transfer, innovation finance, etc.;
- Policies supporting directly innovation activities in private sector.

As Exhibit 7 shows, the number of policy institutions (lower estimate!) at State level amounts to 28, those at Federal level to 7. As a matter of fact, the presented list of institutions at State level is by far incomplete, as some of them are representing up to 20 (!) subsidiary institutions of intermediary character. Moreover, it's quite all right to assume, that a typical development agency is running up to twenty programmes or large, multi-annual projects, involving a larger number of partners[13]. At the level of the Federal agencies, FFG, AWSG, and FWF, the aggregated number of programmes goes up to 60.

Furthermore, half of the States run development agencies employing a considerable number of staff (around 100). Adding all institutions, indicated in Exhibit 7, together, the number of staff goes beyond 1,000, not included here the support staff of more than hundred technology and innovation centres throughout the country, which constitutes another 200-300 staff. About one third of them consider themselves as 'local' development agencies.

Instead of carrying out a rather superficial description and analysis at national level, we will take advantage of a study, which was conducted in 2005 addressing the issue of portfolio and related governance problems[14].

- **Narrow view at R&D and indicators**. The big 3% goal (Barcelona, Lisbon) has dominated the debate in the recent years. This in fact has narrowed the view to R&D an at an increase of specific indicators. A broader view is thus reasonable,

[13] To give an example: The State of Oberösterreich has recently adopted a comprehensive programme, 'Innovatives Oberösterreich 2010', which includes about 50 measures, of which most of them are implemented by the state's development agency, the Technologie Marketing Gesellschaft (TMG). The TMG itself is representing about 20 sub-organisations such as research organisations, competence centres, cluster organisations, technology and innovation centres, incubators.

[14] Schibany A, L Jörg (2005), Instrumente der Technologieförderung, Institut für Technologie- und Regionalpolitik, Joanneum Research, Technopolis. Commissioned by the Austrian Council. Vienna.

including other issues and policy areas as well as a certain distance to (quantitative) indicators.

- **Broadening the scope of action**. STI policy as an important driver for economic growth has gained acceptance during the last decade. This has lead to insight and related action, the STI has to be adjusted with other policy areas. In practical terms, multi-actor policy making is still in its infancy, all the more, as the core of STI policy making has a (too) strong eye at funding.
- **The changing role of R&D expenditures in the business sector**. Major parts of the increase of corporate R&D since the mid-90ies is endogenous. Public spending of corporate R&D is declining in the OECD and EU countries. In Austria the share of public funding of private R&D amounts to 5,6% (EU: 7%). Taking into account some curious definitions (whereafter most of the public research centres such as the Austrian Research Centres or Joanneum Research) are considered as business sector, the share decreases to 3,5%. Moreover: R&D expenditures in the business sector are highly concentrated: The largest 25 companies account for 61% of business sector R&D spending. In Austria, the ten largest 10 firms (in terms of R&D expenditures) amount for 43% of total business sector R&D spending. This calls for disillusionment in the scope of public policy and for a more rational approach.
- **Austria needs a changed self-image**. Austria has doubled its R&D expenditures between 1995 and 2004, arriving at the third place after Portugal (which started from a low level) and Finland. This brings Austria into the small group, which convincingly achieves the 3% objective. This should, however, not lead to an increased benchmarking and scoreboard race, but at a higher level of self-confidence, in particular vis-à-vis the expectation of a levelling out of the R&D rate. This will in particular lead to a shift of attention from quota to portfolio.
- **Variety of funding instruments has increased** over the last decade. This allows on the one hand to address existing gaps and deficits in the innovation system more precisely. At the same time, the scope of target groups has been refined and thus increased. Notwithstanding this, while efforts to increase the quality of programmes (design, evaluation, management of implementation) has improved considerably, awareness for the management of portfolio is still weak, not to mention poor practice, first of all poor endowment with data.
- **Complete, even overloaded portfolio, room for improvement**. Over decades, commentators complained the existence of so-called funding-gaps. In the course of one decade, the portfolio of funding instruments and funding schemes, both national as well as regional has flourished at becoming one of the most diverse in OECD / EU countries. Paradoxically, the lion's share of funding is still earmarked for some sort of 'basic supply': indirect funding through tax deduction and direct funding of mainly single-firm R&D projects, both running the risk of accepting low additionality. In both regards there is room for improvement. Two particularly critical issues are the sub-critical financial endowment of and a certain competition amongst programmes, mainly for beneficiaries.
- **Cooperation, platforms, and clusters: The winners**. Over a long period, the Austrian innovation system suffered from a too poor collaboration both within the business sector as well as between the public / higher education and business sector. Since the mid / late 90ies, however, more or less each new instrument / scheme required or at least awarded cooperation. The most prominent schemes are those which address the interface between heterogeneous actors, particularly

between firms on the one hand and public research centres, universities, universities of applied sciences ('Fachhochschulen'), technology transfer organisations, technology centres on the other hand. From hindsight, we can conclude, that an extraordinary effort was required to overcome the existing culture. However, time has come, to re-think a further increase of cooperative instruments / schemes. Even more, it might be advisable, to decrease the cooperative aspect at the benefit of strengthening the respective institutions.

- **Reform of the university system and weakening through role overload**. The Austrian university system is currently undergoing one of the most radical reforms in its history, as the individual universities are to a high degree autonomous in their curricula, internal organisation, budget, and staff. At the same time, increase of funding was mainly allocated to the business sector to the effect, that the university sector has been benefiting merely as a partner in cooperative arrangements. This has lead and still leads to an overload with roles, which in particular put high pressures at the management capacities of the universities. Generally, it will take another 5-10 years to adopt the university reform and to understand the impacts of the (de facto) policy of the last about 5-10 years on the performance of the universities and the innovation system as a whole.
- **To sum up (with a certain focus at the role and contribution of Structural Funds)**: Austria, both at Federal as well as State level, has undergone a tremendous change in the last decade. The number of policy actors (ministries, funding agencies, development agencies) has increased at both levels. The role of STI policy has gained high acceptance in the overall policy portfolio both at federal as well as state level. Austria is well on its way to meet the Barcelona target (as one of the few countries). The standards of policy making have improved significantly (again being equipped to be measured against highest standards). On the other hand, a number of 'collateral' problems have arisen: (i) The number of actors, instruments, programmes, larger projects has increased at an even higher pace. This in turn create problems with transparency, efficiency, and pertinence. (ii) There is some doubt about the additional benefits of increased cooperation. In fact, there are indications of a reversed impact. (iii) Due to the small size of most of the schemes and programmes competition amongst policy actors and hunting for beneficiaries occurred. Structural Funds considerations should therefore focus at the entire portfolio of already existing actors, their position in the broader policy arena, and, of course of their portfolio and past experience. It will be important, to carefully address 'European additionality' and reduce the risk of overloading existing federal / state activities. Learning from mid-term evaluations[15] indicate a certain danger of both weak connection and competition with the federal / state portfolio.

[15] Cf. the mid-term evaluation reports in Further reading.

3.3 Conclusions: the national innovation system and policy mix

Exhibit 8: Key opportunities and constraints for investment by the Structural Funds

Policy objectives	Opportunities for Community funding (national priorities)	Constraints or bottlenecks (factors limiting Community funding)
Improving governance of innovation and knowledge policies	• address the **whole** portfolio of (i) actors, (ii) address their **entire** portfolio before evaluating pertinence of additional Community funding • aim at a broader view of innovation, not just R&D • disentangle the cooperation web • be careful with the 'exploitation' of universities	• the policy system might be too complex (in terms of number of items as well as in interactions between actors) to cope with it in order to design measures with a high level of European additionality • the fact of the existence of autonomous Federal States can impede cross-state measures (test-case: cluster programmes)
Innovation friendly environment	• direct policy actors (both in the design as well as in the implementation phase) at a strict orientation at demand-side issues, thus be sceptical about supply-oriented measures • there is some awareness to overcome the supply-side policy approaches	• no real bottlenecks, as most of the policy actors have achieved at a high level of awareness for RTI • problems may arise from poor accountability of framework-related activities
Knowledge transfer and technology diffusion to enterprises	• Most of the policy actions are motivated by the idea of 'Knowledge transfer and technology diffusion to enterprises' (sic!) • Knowledge institutions often suffer from poor understanding of 'requirements' of the world 'out there' which reduce their attractiveness for firms • Community policy should thus be open for a change of direction of making knowledge institutions more open and aware of understanding 'requirements'	• it will be a hard job to convince either of the parties (knowledge institutions such as public research centres, universities on the one and firms on the other hand, but in particular the former), that asking good questions could have a market value of its own right
Innovation poles and clusters	• one of the strengths of regional innovation policy in Austria, mainly focused at information provision, support of cooperative projects (at the danger to run the cluster policy as a (smallish) programme of its own) • the next generation of cluster policy should address the entire institutional and policy framework (e.g. regulation as a vehicle for innovation)	• some constraints, but no bottlenecks: some States are gradually opening their cluster approach (Wien: life science and ICT through coordination of all available policy schemes; Niederösterreich: linking existing policies with new measures in the food sector, mainly through coordination; Tirol in the field of health and health technology) • resistance may arise from 'church steeple policy' (= protecting the small field of influence)

Support to creation and growth of innovative enterprises	• technology centres and incubators: re-shaping the role of incubators by reducing their role as local agencies, rather re-orient at core business (= breeding and accompanying firms in their start-up and growth phase)	• a similar situation as in the case of clusters: no open resistance, but a certain inertia in overcoming the local hero behaviour, thus gradual improvement
Boosting applied research and product development	• as far as Community action is concerned, proposed measures should be carefully evaluated against already existing measures, mainly at national level • instead of boosting applied research and product development (1): focus at firms and aiming at better understanding their markets and environments • instead (…) (2): focus at knowledge institutions and aiming at better understanding 'requirements'	• since supply with schemes supporting applied research and product development is in the heart of mind of many policy makers there is a certain risk to add on **additional** schemes with the help of Community funds • cf. above: it will be a hard job to convince either of the parties (knowledge institutions and firms), that asking good questions has a market value of its own right

4 Structural Funds interventions to boost innovation and create a knowledge economy: 2000-2006

This section of the reports provides an analysis of the patterns of Structural Fund expenditures in the fields of innovation and knowledge-based economy during the current programming period (2000-2006 for EU-15 or 2004-2006 for the new Member States). It examines the patterns from both a strategic point of view (the policy mix pursued by the Structural Funds programmes) and at an operational level (consumption of funds, management of innovation measures, indications of relative effectiveness of measures, case studies of 'good' practice).

4.1 Strategic framework for Structural Fund support to innovation and knowledge

4.1.1 Strategic approach to innovation & knowledge in Structural Fund programmes

As can be seen from Exhibit 9, each Federal state has some Structural funds available. Except for the State of Burgenland, which is an Objective 1 region, all the remaining eight Federal States are Objective 2 areas, however to different degrees. As can clearly be seen, the largest share is allocated to the quite small State of Burgenland. Quite astonishing is the large share which is allocated to the State of Steiermark, which sharply contradicts with the image of the region as a vibrant high-tech region. However, as can also be seen from Exhibit 9, the Steiermark allocates 39% of the total funds allocated to RTDI interventions (or 24% of own Structural Funds money). A similar pattern can be observed for the State of Oberösterreich (or 25%). Both States follow a rather active policy in the fields of competence centres and in particular in the establishment of technology and innovation centres / incubators.

Exhibit 9: Regional allocation of resources to RTDI interventions and total [EUR]

Programmes	RTDI INTERVENTIONS				TOTAL			
	Total SF	ERDF	ESF	share	Total SF	ERDF	ESF	share
OBJECTIVE 1								
Burgenland	16.640.862	16.640.862	0	12%	282.906.141	181.519.085	57.440.139	28%
OBJECTIVE 2								
Steiermark	55.035.313	55.035.313	0	39%	224.589.487	204.711.606	19.877.881	22%
Niederösterreich	17.739.400	17.739.400	0	12%	184.967.000	184.967.000	0	18%
Oberösterreich	30.245.806	30.245.806	0	21%	127.164.000	127.164.000	0	13%
Kärnten	10.942.000	10.942.000	0	8%	89.039.000	84.991.000	4.048.000	9%
Tirol	3.580.000	3.580.000	0	3%	46.654.000	46.654.000	0	5%
Salzburg	2.171.691	2.171.691	0	2%	18.533.000	18.533.000	0	2%
Vorarlberg	3.441.000	3.441.000	0	2%	23.695.000	23.695.000	0	2%
Wien	2.886.636	2.886.636	0	2%	18.888.000	14.888.000	4.000.000	2%
Total Regional OPs	142.682.708	142.682.708	0	100%	1.016.435.628	887.122.691	85.366.020	100%

Source: Programming documents and financial data provided by DG REGIO

Burgenland, Niederösterreich, and Tirol in particular, to some extent Kärnten show a below average allocation of Structural Funds money to RTDI. As regards to Tirol, the allocation regime with respect to Structural Funds can be considered as complementary to own regional money which is managed by the Tiroler

Zukunftsstiftung. Kärnten and Niederösterreich are suffering from with low levels of absorptive capacity for RTDI measures, where major parts of the 'industrial zones' are excluded from funding.

Exhibit 9 does not show the sub-regions which are eligible for funding and which are not. Mid-term evaluation, however, has revealed, that in most of the regions, the highly differentiated assignment of sub-regions is quite unfavourable for a series of types of interventions. In particular, cooperation is often impeded by the fact, that the 'centres' are typically not eligible, which hampers firms, located in disadvantaged regions to benefit from the prosperous ones through collaboration.

As the mid-term evaluations furthermore show, the overall objectives of the respective programmes, sub-programmes, priority area and so forth are generally met. However, when coming to details and day-by-day acting, both firms as well as funding bodies show a certain tendency to prefer less risky projects. In fact, there are some reasons behind these adverse behaviour: (i) quantitative indicators are easier to be met with less risky projects, (ii) access to the innovative 'centres' (through networking) is often prohibited from eligibility criteria, (iii) time horizons and monitoring practices favour short term, thus often hardware / investment projects.

Exhibit 10 provides an overview of resources at objective 1 and 2 level allocated to RTDI interventions: 20,6% of objective 1 funding is allocated to RTDI, 36,3% in the objective 2 areas. 55,7% in the objective 1 regions and 47,2% in the objective 2 regions has been disbursed by end of 2005.

Exhibit 10: Overall allocation of resources at objective 1 and 2 level to RTDI interventions and total [EUR] (3rd calculation)

Objective	Total cost	SF			NF	
		Total	ERDF	ESF	Public	Private
RTDI INTERVENTIONS						
Objective 1	164.321.581	58.295.914	58.295.914	0	15.653.895	90.371.773
Objective 2	1.060.079.867	268.755.141	268.755.141	0	215.388.480	575.936.245
TOTAL COHESION POLICY						
Objective 1	889.251.238	282.906.141	181.519.085	57.440.139	106.664.845,00	499.680.252
Objective 2	3.865.382.660	733.529.487	705.603.606	27.925.881	583.631.246,00	2.548.221.927

Source: Programming documents and financial data provided by DG REGIO

The calculations carried out in Exhibit 10 and Exhibit 11 are based and limited to the following RTDI codes[16]:

- 181 Research projects based in universities and research institutes
- 182 Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes
- 183 RTDI Infrastructure
- 184 Training for researchers

Exhibit 11 provides a varied picture of what the restriction to RTDI can mean in the respective programmes in the objective 1 and 2 regions in Austria. The following characteristics are the most striking:

[16] Additional calculations based on broader definitions of innovation are presented in Appendix D.

- In the objective 1 region 'Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)' cover 37% of the overall RTDI resources, 25% are allocated to Financial engineering (only for SMEs).
- A similar pattern reveals in objective 2 regions, where the 'Shared business services' category absorbs 30% of overall RTDI resources. The most prominent intervention measure however, covering 35% of overall RTDI resources, refers to 'Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes'. Detailed analysis shows, that this latter category has to do with the quite successful implementation of the so-called competence centres.
- Summing up, we can conclude, that about 60% of the overall resources devoted to RTDI measures are allocated to incubator units and competence centres. These findings are somewhat ambivalent, as these two federal programmes are amongst the most successful programmes in last decade. On the other hand, one can raise some doubts on the additionality effects resulting form EU programmes. However, even if there is only limited additionality in economic terms, the additionality effects on the behavioural side cannot be overestimated, as these programmes helped to a high degree to transfer good practice in programme management from the Federal level to the State level (which is not automatically the case).

Exhibit 11: Absorption capacity by field of intervention within the area of RTDI (enlarged definition) (3rd calculation)

Codes	allocated	disbursed	expenditure capacity
OBJECTIVE 1			
162 - Environment-friendly technologies, clean and economical energy technologies (only for SMEs)	2.992.621	786.305	26,3%
164 - Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)	21.549.783	13.927.508	64,6%
165 - Financial engineering (only for SMEs)	14.534.567	7.300.800	50,2%
181 - Research projects based in universities and research institutes	7.238.251	4.112.666	56,8%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	6.419.011	3.331.840	51,9%
183 - RTDI infrastructure	2.983.600	1.898.930	63,6%
322 - Information and Communication Technology (including security and safe transmission measures)	664.343	248.045	37,3%
324 - Services and applications for SMEs (electronic commerce and transactions, education and training, networking)	1.913.738	887.246	46,4%
Total objective 1	**58.295.914**	**32.493.340**	**55,7%**
OBJECTIVE 2			
152 - Environment-friendly technologies, clean and economical energy technologies (only for large enterprises)	2.525.140	1.196.664	47,4%
153 - Business advisory services (including internationalisation, exporting and environmental management, purchase of technology) (only for large enterprises)	2.031.700	801.574	39,5%
162 - Environment-friendly technologies, clean and economical energy technologies (only for SMEs)	40.243.210	19.147.156	47,6%
163 - Business advisory services (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology) (only for SMEs)	15.882.407	7.157.435	45,1%

164 - Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)	79.456.726	34.597.386	43,5%
165 - Financial engineering (only for SMEs)	178.920	105.329	58,9%
181 - Research projects based in universities and research institutes	19.708.005	9.078.501	46,1%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	94.378.343	50.587.626	53,6%
183 - RTDI infrastructure	11.955.498	3.359.323	28,1%
322 - Information and Communication Technology (including security and safe transmission measures)	479.064	302.336	63,1%
324 - Services and applications for SMEs (electronic commerce and transactions, education and training, networking)	1.916.128	604.671	31,6%
Total objective 2	**268.755.141**	**126.938.002**	**47,2%**

Source: programming documents and financial data provided by DG REGIO

4.1.2 Specific measures in favour of innovation and knowledge

Exhibit 12 summarises the relative importance of innovation and policy measures by matching key measures with respect to specific weaknesses or threats (challenges) identified in the programming documents (or national / regional strategic documents).

As outlined in Chapter 3, particularly in Chapters 3.2 and 3.3, the number of programmes and larger projects goes to 60 at Federal and considerably more at State level. Particularly, what is considered as a few projects within a programme at Federal level turns out as a programme at State level. Examples are competence centres or incubators. It is thus impossible, to identify individual innovation and knowledge measures. Accordingly, the following Exhibit 12 should be read with some caution, indicating rather qualitative priorities rather than precise figures.

Exhibit 12: Key innovation & knowledge measures

Policy area	Number of identified measures (all programmes)	Approximate share of total funding for innovation & knowledge measures	Types of measures funded (possibly indicating importance)
Improving governance of innovation and knowledge policies	• at federal level there is a continuous stream of programme design, adjustment, evaluation, benchmarking studies • ad State level rather ad hoc / demand driven	• 2-3 MEUR per year (incl. intelligence activities within agencies etc.)	• a community of 30-40 people is permanently employed with 'intelligence services' (except agency staff)
Innovation friendly environment	• Federal level: public understanding of science initiative 'Innovatives Österreich' • fForte: umbrella programme covering most of the initiatives supporting 'women in science' • at State level: regional development agencies	• n.a.	• Austrian RTDI policy has still a strong focus at funding. Shaping an innovation friendly environment is rather new. The most visible and quite successful attempts are cluster initiatives, which have a strong implicit orientation at the promotion of innovation

Policy area	Number of identified measures (all programmes)	Approximate share of total funding for innovation & knowledge measures	Types of measures funded (possibly indicating importance)
	are quite active in promoting the innovation issue, particularly cluster initiatives (total: about 30)		and collaboration.
Knowledge transfer and technology diffusion to enterprises	• Several dozens of programmes and measures both at Federal and State level have some element of diffusion	• n.a.	• to the extent, that collaboration contributes to diffusion (and in fact it does), there is hardly no programme which at least encourages collaboration
Innovation poles and clusters	• > 30 cluster initiatives at regional level • > 100 regional poles	• n.a.	• cluster initiatives are the success story of regional RTDI policy in the last decade, almost any State is running some cluster initiatives, particularly Oberösterreich, Niederösterreich, and Steiermark • as regards to regional poles the >100 has to be understood in terms of self-definition, as each technology centre / incubator considers itself as a pole for local development
Support to creation and growth of innovative enterprises	• most visible at Federal level: academic incubator programme A*plus*B, incubator support programme REG*plus* • complementary activities at State level (using SF money)	• n.a.	• like clusters, most Austrian States have established at tight network of technology centres / incubators (> 100) • most of them have somewhat left behind their original mission (as an incubator) and changed into some sort of local development agency
Boosting applied research and product development	• The most outstanding policy innovation in the last ten years are the so-called competence centres (K*plus*, Kind, Knet), aiming at a long-term strategically oriented collaboration in R&D between academic and business sector:	• n.a.	• competence centres: high funding rate (50-65%) public funding (grants) to overall costs of running specific legal entities (mainly limited companies) • project based funding: grants (average funding rate: 27% (2004))

Policy area	Number of identified measures (all programmes)	Approximate share of total funding for innovation & knowledge measures	Types of measures funded (possibly indicating importance)
	about 40 centres employing > 1200 researchers • Traditionally, a large share of public funding goes to the business sector through funding of R&D projects of firms. Half of the States complement Federal funding with additional money.		

Nb: This table is a summary of the table in appendix D.2. The total of the percentage share per policy area may sum to more than 100 since certain measures fall into several categories.

Looking at the portfolio of programmes and measures, some **peculiarities** can be revealed.

- While the bulk of funding is earmarked to some sort of 'basic supply' (indirect funding through tax deduction and direct funding of mainly single-firm R&D projects), the most visible programmes are rather small. Two particularly critical issues are the sub-critical financial endowment of and a certain competition amongst programmes, mainly for beneficiaries.
- Furthermore, both federal agencies as well as State level agencies are suffering from an overload with too many too small programmes / measures. However, there are some indications, pointing at a more comprehensive approach integrating several types of policies and several types of instruments under one agency or more comprehensive programme. Examples are the establishment of the Forschungsförderungsgesellschaft (FFG) and Austria Wirtschaftsservice Gesellschaft (AWSG), integrated, multi-annual programmes ('Innovatives Oberösterreich 2010'), joint policy making in Vienna (Zentrum für Innovation und Technologie (ZIT) and Wiener Wissenschafts-, Forschungs- und Technologiefonds (WWTF)) in their different approaches to develop the life science / ICT clusters in the Greater Vienna Region, Niederösterreich in its attempts to link funding, business services with regulation in the food sector.
- Generally, as outlined above, future Structural Funds policy is well advised to appraise its policies, measures, and funding against the total of existing policies, measures, and institutions in order to avoid a further increase of variety, all the more as major shares of SF (60%) in the area of RTDI has been allocated to measures, which would have been funded from other resources, anyway (competence centres, to some extent incubators).

4.2 Learning from experience: the Structural Funds and innovation since 2000

4.2.1 Management and coordination of innovation & knowledge measures

This section reviews the overall management of Structural Fund interventions in favour of innovation and knowledge during the current period. It examines the coherence of the roles of key organisations or partnerships in implementing Structural Funds measures for innovation and knowledge, the linkages between Structural Fund interventions and other Community policies (e.g. the RTD Framework Programme) and the financial absorption and additionality of the funds allocated to innovation and knowledge.

Coordination between the regions. Due to many reasons coordination activities between the regions are rather poor. The most relevant factor is the high level of formal autonomy of the respective State governments, particularly as each of them is endowed with a directorate responsible for economic affairs, spatial planning, or EU affairs. However, there is some transfer of knowledge and experience, on the one hand through a certain coordination of the Austrian Conference on Spatial Planning (Österreichische Raumordnungskonferenz, ÖROK) as well through the involvement of a rather small number of specialised consultants both in programming as well as in evaluation. Furthermore, the federal government, except for the ÖROK, has neither the formal power nor the factual capacities to exert a significant influence on programming activities. This situation is not specific to Structural Funds issues, but does mirror a general issue, which is felt as a problem, from time to time.

Management structure. Each region / state has developed its own capacities and procedures in programming, thus in the preparation of planning documents, mainly with a leading role of the respective directorate of the State government (Exhibit 13, responsible of economic affairs (Oberösterreich, Salzburg, Steiermark), EU affairs (Burgenland, Wien, Vorarlberg), or spatial planning (Niederösterreich, Tirol). Kärnten is an exception, where this role is delegated to the Kärntner Wirtschaftsförderungsfonds (KWF). The same holds true for the implementation of the respective programmes and measures, typically within the same structure, where the programme secretariat converts from the programming unit to the implementation unit. Interestingly, while planning and implementation is under the responsibility of the States (from obvious reasons), the monitoring part is centralised and delegated to the Austrian Conference on Spatial Planning (ÖROK), which is quite advantageous for all involved parties, all the more as the ÖROK is perceived as a neutral, non-partisan authority.

Participation and separation. Here we can find some paradox. Generally, planning processes are to a large extent participative by character, which is not only determined by a general culture, but also by the puzzle-type structure of eligible regions, which goes down to the small of small municipalities, sometimes resulting in a too detailed and thus inflexible programming outcome. Notwithstanding this, there are a number of blind spots, when in comes to coordination with big related policy areas, such as general RTDI policy at State level, not to mention the federal level. Actually, two

different cultures are to some extent clashing at the interface of Structural Funds planning (essentially bottom-up) and of general RTDI policy (with quite some strong elements of top-down, not the least through the involvement of the States in the financing and implementation of their RTDI policy such as competence centres, programmes for implementing / developing incubators, etc.). As a consequence, the high participative character is Structural Funds planning does not necessarily ensure a high degree of coordination between the 'big bakeries' in their respective policy domains.

Exhibit 13: Responsibilities for planning and implementation of SF

Region / State	Agency / Government body	economic affairs	spatial planning	EU affairs	agency
Burgenland	Amt der Burgenländischen Landesregierung, Stabsstelle Europabüro und Statistik			x	
Kärnten	Kärntner Wirtschaftsförderungsfond (KWF)				x
Niederösterreich	Amt der NÖ Landesregierung, Abteilung RU2, Raumordnung und Regionalpolitik		x		
Oberösterreich	Amt der OÖ Landesregierung, Abteilung Gewerbe, Wirtschaftspolitik	x			
Salzburg	Amt der Salzburger Landesregierung, Abteilung 15, Wirtschaft, Tourismus und Energie	x			
Steiermark	Amt der Steiermärkischen Landesregierung, Abteilung 14, Wirtschaft und Arbeit	x			
Tirol	Amt der Tiroler Landesregierung, Abteilung Raumordnung-Statistik		x		
Vorarlberg	Amt der Vorarlberger Landesregierung, Abt. Europaangelegenheiten und Außenbeziehungen			x	
Wien	Amt der Wiener Landesregierung, MA EU-Förderungen			x	

Source: Single Planning Documents

Funding as an exploitable resource. The exploitation of allocated funds has been revealed as a strong driver in the generation and selection of respective projects. Increases in allocated funding is often determined by an increased 'demand' for funding of specific projects, while others may suffer from weakly developed absorption capacity and thus of weak demand.[17] In several cases a re-allocation of funds at mid-term has been determined by the changing demand-conditions on this 'funding-market'. A more thorough justification of the funding rationales should be a critical issue in future programme periods.

Lessons for future Structural Funds planning. The paradox, revealed above, should make actors of future programming exercises alert, not to feel too comfort with participatory bottom-up approaches, as they run the risk of producing considerable blind spots and less-risky projects. Even more, a too strict bottom-up approach can prevent from a broader view at problems, needs, and opportunities, which have no addressable 'owner' amongst the different parties and stakeholders. This in turn prevents from coordination with related or complementary policy fields at the same level (= region / state) as well as at federal level. Not the least, bottom-up planning nurtures the tendency to consider Structural Funds as resources, ready for exploitation. A caveat has to be made, however: This critical attitude does not apply

[17] This exploitation behaviour has revealed as an implicit attitude even amongst evaluators of the mid-term evaluations, as they time and again recommended a re-allocation of funds due to a weak demand for a specific measure to those areas, where a higher 'demand' could be observed.

to all States, and it should not be misunderstood as an assessment of things, which went wrong. Rather, it should be understood as 'missed opportunities'.

4.2.2 Effects and added value of Structural Fund support for innovation and knowledge

This section of the report analyses the effects and added value of the Structural Fund interventions in favour of innovation and knowledge during the current programming period. The analysis is based on two main sources, namely: available evaluation reports or studies concerning Structural Fund interventions; b) interviews and additional research carried out for this study. Accordingly, this section does not pretend to provide an exhaustive overview of the effects or added value[18] of Structural Fund interventions but rather is based on the examination of a limited number of cases of good practice. These good practice cases can may concern the influence of the Structural Funds on innovation and knowledge economy policies (introduction of new approaches, influence on policy development, etc.), integration of Structural Funds with national policy priorities, promoting innovative approaches to delivery (partnerships), or measures which have had a particularly important impact in terms of boosting innovation potential, jobs and growth.

Objective 1 region[19]

Generally 20,6% of all objective 1 region funding has been allocated to RTDI in a wide sense including innovation and information society issues. 'Shared business services'[20] cover 37% of the overall RTDI resources, another 25% are allocated to Financial engineering (only for SMEs), 12% to 'Research projects based in universities and research institutes', 11% to 'Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes'.

Regarding the establishment of a venture capital fund (Financial engineering, 25% of all RTDI resources) has been accomplished at mid-term. (Un)fortunately it became utilised within shortest time, which indicates a certain me-too behaviour with respect to this type of support.

The number of business start-ups has been behind expectations. This development has led to the recommendation, to focus support not only at the establishment of infrastructures but also at the support of start-ups and young businesses (particularly for those numerous young, small but expansion-oriented firms).

Several cluster initiatives have been stimulated. They have been rather small in size, thus only a few cooperative innovation projects have been implemented.

In the realm of RTDI (broad definition), projects are generally larger and thus, in terms of numbers, smaller than foreseen. The goals for new products and services as

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[18] A good definition is "The economic and non-economic benefit derived from conducting interventions at the Community level rather than at the regional and/or national level". See Evaluation of the Added Value and Costs of the European Structural Funds in the UK. December 2003. (Available at : www.dti.gov.uk/europe/structural.html)

[19] Cf. for the objective 1 region Wagner et al. (2005)

[20] Business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs, only for SMEs.

well as new jobs are already attained. Moreover, the planned expansion of technology centres / incubators has been finished and proven as quite successful, all the more as it has led to the accomplishment of a full coverage with incubators in the whole region. The number of science-industry competence centres was too ambitious and will thus not be realized. In spatial terms, the northern part of Burgenland benefited most from investments in the priority at Research, Technological Development and Innovation, due to the higher density of R&D-oriented firms. A clear case of strengthening existing profiles.

While support and funding of R&D projects has proven quite successful in terms of demand for support, the support of innovation in services is still without any relevant effect.

As a general rule, the implementation of network type measures has proven quite cumbersome both to set-up and to create impacts, while traditional, single-firm investments or single-firm R&D funding as well as the establishment of physical infrastructure has enjoyed a considerable acceptance.

Objective 2 regions

In the objective 2 regions 36,6% of funding has been allocated to RTDI in a wide sense including innovation and information society issues. 'Shared business services' absorbs 30% of overall RTDI resources (objective 1: 37%). The most prominent intervention measure however, covering 35% of overall RTDI resources (Exhibit 11), refers to 'Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes'.

Detailed analysis shows, that this latter category has much to do with the quite successful implementation of the so-called competence centres. As already indicated, these competence centres would have established to a high extent, whatsoever.

Another 25% have been allocated to incubator units. This has led to rather tight coverage throughout the country's objective 2 regions (of course also of the objective 1 region, cf. above). There is evidence, that a large part these incubator units have been established due to the availability of SF money. In this regard a high degree of additionality has been achieved. On the other hand, one may doubt the **pertinence** of many of these incubators. Anyhow, they are existing as physical entities and, in most cases as management teams. Due to the availability of a Federal programme (REG*plus*[21]), co-financed by the States, which was justified amongst others because of a too narrow orientation at the physical infrastructure dimension ('bricks') at the cost of an orientation at support and networking ('brain'), about half of the hundred incubators achieved the status of a local development agency, providing own services to the local economy (particularly SME) and / or acting as brokers in providing assess to further services and service providers. At the end, we can trace back a quite dynamic process over a period of ten years, transforming physical infrastructure investment into local development agencies and thus into a hub for further services and initiatives.

[21] Cf. www.ffg.at. An evaluation has been carried out by Ohler, Geyer (2005).

Summing up, we can conclude, that about 60% of the overall resources devoted to RTDI measures are allocated to competence centres and incubator units. These findings are somewhat ambivalent, as the competence centres are amongst the most successful programmes in last decade, which would have been established, anyway. One can thus raise some doubts on additionality. As regards to incubators, a certain overload with such units, triggered by Structural Fund money, has ultimately led to the transformation of 'bricks' to local hubs for innovation and business support, networking and access to the 'world out there'.

However, even if there is only limited additionality in economic terms, the additionality effects on the behavioural side cannot be overestimated, as these programmes helped to a degree to transfer good practice in programme management from the Federal level to the State level (which is not automatically the case).

Apart from these two dominant areas of SF intervention with RTDI orientation a number of interesting observations arises:

- Support for individual firms continues to be the dominant feature. Implementation of soft measures has been weak, not the least due to the often too small, structurally weak areas, which does often not have the critical mass to implement certain measures, particularly of networking type.
- Programming often focuses on prioritised sectors. It has been shown, that a restriction to specific sectors is only partially helpful as often the density of the respective target groups. Rather, a concentration on characteristics of firms, is more helpful to achieve desired outcomes and effects.
- Framework conditions of support by SF systematically prefer investment projects. Generally, the tight scheme of EU regional support and the respective financial rules have led and still lead to the tendency to preferably accept projects which are rather unproblematic as regards funding handling – which generally means investment projects, which results in a tendency towards a 'structure conserving' effect of the programme.
- 'Innovative soft measures' and support of 'innovative projects' have been overestimated in terms of number of projects. Again, 'population density' are often too low in order to 'acquire' the expected number of projects. The same holds true for set up new firms.
- To summarise, many of the 'soft measures', respectively those, aiming at RTDI, often lacking from an appropriate number of candidates. In particular, it will be required to put more emphasis on pro-active measures and at the same time to enlarge the target areas mainly to increase the number of candidates and thus to create opportunities for networking.

Good Practice Case 1: Incubators

Beginning in the late 90ies most of the States, particularly Oberösterreich, Niederösterreich, Steiermark and Burgenland, have established incubators, mainly triggered by the availability of SF money. At present, more than 100 incubators of different size and profile are established throughout the country. According both to the funding rationale as well as to the available knowledge in the early years, the focus has been put mainly on the physical aspects and the utilisation of the available space.

Based on an evaluation study in 1999, the Federal Ministry of Transport, Innovation, and Technology launched the so-called REGplus programme, aiming at the development the 'soft skills' of the respective management teams (networking, coaching of tenants, innovation management, etc.). Over the years, about one half of the respective incubators have sustainably been transformed into some sort of 'local development agencies' and as first address in a variety of services, which are either provided by the incubators themselves or through brokerage. In the course of one decade, the availability of (physical) incubators (SF money), together with the so far developed management teams (REGplus, but also other projects, particularly from the INTERREG programme) has eventually led to a vibrant scene of local hubs for innovation and growth.[22]

Good Practice Case 2: Competence Centres

In 1998, the Federal government launched three competence centre programmes (Kplus, Kind, Knet). In its quintessence, competence centres programmes focusing at long-term, outcome-oriented institutionalised cooperative research between the public (academic) and the industrial sector, mainly through the establishment of separate organisational entities. Basically, the competence centre programmes have been purely Federal programmes by intention, as there has been no regional dimension in the decision whether or not a specific centre would have been established. In order to expand the funding volume and to commit the States they were invited to co-finance the programme. Most of them actually allocated SF money to fund their contributions.

At first glance, the establishment of the centres would presumably would have been financed also without SF funding, probably on a slightly smaller scale. From hindsight, however, it has proven a successful policy manoeuvre, as the States have created quite a high awareness for the strategic dimension of research and a more explicit relation between the States and the Federal institutions. There are thus high impacts both at the research level as well as the policy level, however, from hindsight, not by intention.

Not unlike the incubators, in the course of time the competence centres have gained considerable perception at the level of the States (agencies, government), which, in a systems view has created a lot of opportunities for policy making at State's level (more care for the involvement of local firms, higher attention to the local universities, and of links between them etc.).

[22] For details on the REG*plus* programme cf. its mid-term evaluation by Ohler, Geyer (2005).

4.3 Conclusions: Structural Funds interventions in favour of innovation and knowledge

Exhibit 14 provides an overview of main outcomes of innovation and knowledge measures funded by the Structural Funds. However, the 'added value' category has to read with caution. In most cases it refers to changes in the behaviour of economic actors (firms), in other cases it addresses policy actors (agencies, governmental departments). Generally, within the realm of RTDI, most of the funding resources have been allocated to two major field in terms of money (incubators and competence centres). In terms of attention, a third field is worth to be mentioned, which is the implementation of cluster initiatives. As regards to the added value, the outcomes are somewhat mixed:

- **Incubators** are highly visible, they contribute to strengthen the identity of the local economy ('our incubator') and they fit quite well into the criteria and procedures of SF planning and implementation. At the same time, the number of incubators is too high (as far as tax payers' money is concerned), all the more as most of the SF measures have not been primarily addressing the development of management and networking capacities, rather the establishment of the buildings. Only when a Federal programme has been established and when incubator managers used other EU funding, the management and networking of incubators got off the ground.
- **Competence Centres**. The have been mentioned several times. In its quintessence, it was a purely Federal programme by intention, as there has been no regional dimension in the decision whether or not a specific centre would have been established. In order to expand the programme volume and to commit the States they were invited to co-finance the programme. From hindsight, it has proven a successful policy manoeuvre, as the States have created quite a high awareness for the strategic dimension of research and a more explicit relation between the States and the Federal institutions. Thus high impacts both at the research level as well as the policy level, however, from hindsight, not by intention.
- **Cluster initiatives**. They have mainly existed before and outside SF considerations and planning. SF were purposefully used to feed the respective initiatives. As a policy element they have achieved high visibility and policy attention. In all cases they are operated as separated measures with a sharp distinction to other measures, which was quite helpful in the initial phases. Two States are going to loose this bonds by open the realm of cluster initiatives through integration of a wider range of policy elements and institutions (Niederösterreich: gradually, Wien: radical).

As a **general observation**, SF in the field of RTDI has hardly originated processes. Rather, where SF involvements have proven successful, they where mainly used as a quite welcomed additional source of funding. The main initiatives have been stimulated elsewhere, except for the incubators, where the direct impact from SF is highly ambivalent, as it has led to a oversupply with buildings (without proper follow-up resources). The remaining measures in the field of RTDI have been proven as either too much oriented at research (collaborative with research institutes or universities) and thus at the 'high end' or at investment in physical goods. Finally, a

detailed look at the SPDs reveals a structural weakness of by far all funding regions, which is the too wide spread of too many smallish measures at too many target groups / actors. This has mainly to do with a specific type of organisation of the respective planning processes, mainly through the involvement of (too many) stakeholders, whose wants and wishes where often directly put into the shopping basket. In fact, a re-thinking of the process of programme planning and the role of the responsible authority is due, which could be inspired from the role of a sports trainer or a doctor, sometimes of dietician (cf. incubators).

Exhibit 14: Main outcomes of innovation and knowledge measures

Programme or measure	Capability	Added value
Objective 1 region		
Environment-friendly technologies, clean and economical energy technologies (5%)	supporting 'sustainable' technologies	Low added value due to the fact, that most projects have been physical investment, at low risk and easy to handle from the SF authorities.
Shared business services (business estates, incubator units …) (37%)	Provide (physical) infrastructures for firm-set up and support in their development phase	High impact in terms of fully coverage of the region with incubators. Incubators started to work, specifically in the larger incubators (Eisenstadt), however with assistance of other funding schemes (Federal (REG*plus*), EU (Interreg). Start-ups have been behind expectation. As stated, SF investments – unfortunately – had to be completed by other instruments and funding schemes in order to fully exploit the opportunities from SF measures.
Financial engineering (25%)	supporting firms through their growth phase through the provision of equity capital	VC fund has been quickly adopted (however based on a low volume of investment capital) quite high added value due to the fact, that private equity sector does not reach the (objective 1) region.
Research projects based in universities and research institutes (12%)	support collaboration with university and RTOs through contract research	Little adoption, low rate of new R&D jobs. At the same time overwhelming funding opportunities at level of Federal programmes. Thus little value added due to availability of programmes at national level. Generally, role of R&D in general and cooperation with universities / research institutes have been overestimated.
Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes (11%)	Enforce technological capabilities mainly through cooperation between firms and / or research institutes in the fields of innovation, marketing, training, internationalisation	Several cluster initiatives have been stimulated, they have been rather small in size, thus only a few cooperative innovation projects have been implemented. Generally, a more pro-active and a greater commitment would have been required. The number of science-industry competence centres was too ambitious and will thus not be realized. In spatial terms, the northern part of Burgenland benefited most from investments in the priority at RTDI, due to the higher density of R&D-oriented firms. A clear case of strengthening existing profiles.
Objective 2		
Environment-friendly technologies, clean and economical energy technologies (15,9%)	supporting 'sustainable' technologies in SMEs	Low added value due to the fact, that most projects have been physical investment, at low risk and easy to handle from the SF authorities.

Business advisory services (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology) (5,9%)	Enforce technological capabilities mainly through cooperation between firms and / or research institutes in the fields of innovation, marketing, training, internationalisation, mainly through addressing 'clusters'	Clusters initiatives have proven as an efficient means to address a variety of innovation related issues. Moreover, they have successfully contributed to increase attention in the wider economy and policy realm. After a period of 5-8 years of running cluster initiatives mainly as separate programmes, some States (Niederösterreich, Wien) are gradually open the concept of cluster policy by integrating a broader range of policies and policy areas. Thus high impact, not the least through the availability of SF, however not primarily catalysed through SF, but enforced.
Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (29,6%)	Provide (physical) infrastructures for firm-set up and support in their development phase	High impact in terms of coverage with incubator units. Generally, however, too many incubators and a too narrow focus at the physical dimension. Underrating of the management aspect. Combined with a national programme it was possible to overcome the strong orientation at 'bricks'. SF could have been oriented at funding of (management and networking) resources from the outset.
Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes (35,1%)	Enforce technological capabilities mainly through **long-term** cooperation between firms and / or research institutes, mainly through the establishment of competence centres	High impact from competence centres in terms of a more effective type of organisation of collaboration / contract research between firms and research organisations / universities. Competence centres are in the core of policy attention at both Federal and State level. However, funding of competence centres would have taken place more or less even without co-funding from the States and even more without co-funding from the SF. However, since it has de facto taken place, the States ultimately are, after all, in a better position as they have appropriated these centres and included them into their portfolio. Thus strong impacts at policy level.

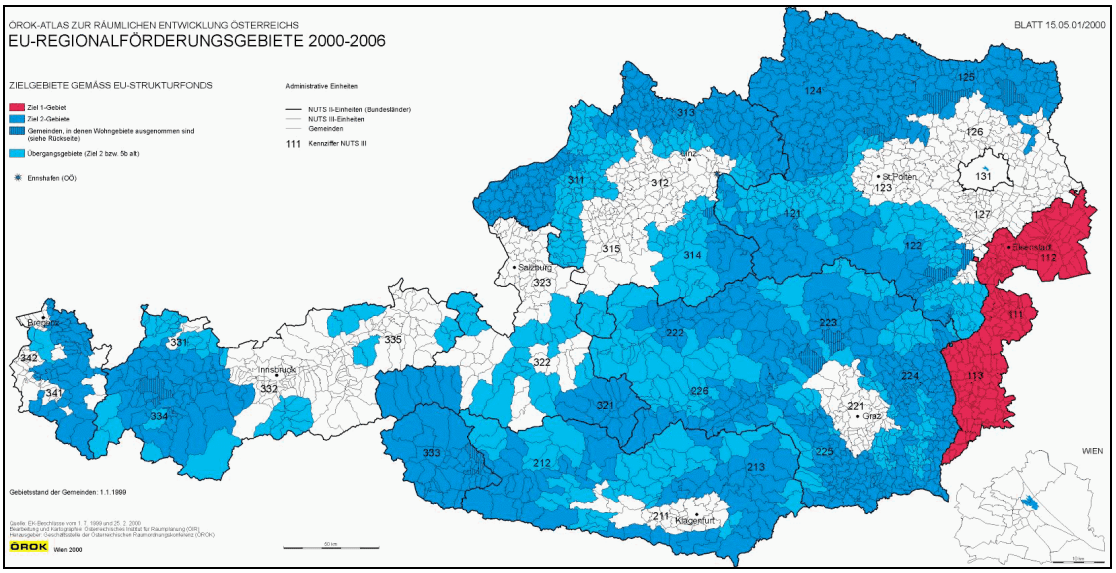
5 Regional potential for innovation: a prospective analysis

This section of the report seeks to summarise and draw conclusions from the analysis of the preceding sections, available studies and interviews and focus groups carried out for this study in order to provide an analysis of the regional innovation potential. In doing so, the aim is to provide a framework for orientations in terms of future Structural Fund investments in innovation and knowledge.

5.1 Factors influencing regional innovation potential

It is difficult to conceive Austria as a composition of coherent regions, generally, and in particular with respect as a basis of policy making. There are at least three aspects, which should be taken into account, when reflecting on future SF policy.

Exhibit 15: Structural Funds regions in Austria



Source: Austrian Conference on Spatial Planning, www.oerok.at

- **Patchwork and mismatch between economic / societal and political definition of regions**. As can be seen from Exhibit 15, Austria as a regional entity in the context of SF policy must be considered as a patchwork. As a matter of fact, demarcation of regions and the definition of the political responsibility is made on the basis of the political-administrative division of labour, which are the Federal States. There are numerous cases, where the definition of regions in economic terms significantly differ from those based on political responsibilities and are in fact sub-optimal for the development of the regions. The most striking examples are, considered here as **one** region in economic / societal terms, the Greater Vienna Region, the Carinthia – Eastern Tyrol area, the south-west of Styria and the south of Burgenland, the Mühlviertel-Waldviertel area, etc.. At a sub-regional level, the western part of the Mostviertel (St. Valentin, Amstetten) is rather part of the Wels-Linz-Steyr agglomeration than of the agricultural area, which surrounds the mentioned industrial centres, etc.. In the context of 'Factors influencing regional innovation potential', the understanding of what is understood as

'regions', is critical. Here we are confronted with inadequate definitions of regions. Future SF policy planning thus should question the politically determined concept of regions and put much effort at proper definition of regions. Realistically, it will lead to more trans-border cooperative arrangements in policy planning and implementation rather then the autonomous handling of cross-border regions.

- **Mix of styles in policy planning**. During the last decade, not the least due to the 'educating' role of EU policy making, Austria has tremendously improved its policy culture, both at the federal as well at the States' level. A closer look, however, reveals different approaches and styles to policy planning, which can be complementary, but which are quite often conflicting. As a matter of fact, the most dominating approach, particularly at the States' level, is bottom-up, mainly through involvement of stakeholders / beneficiaries. Mid-term evaluations of SF have shown, that the too tight involvement of stakeholders time and again has lead to a sub-optimal portfolio of measures (too risk-averse, too broad, sub-critical size). Foresight exercises on the other hand, are more and more carried out, however, for the most part, ad hoc, triggered by specific opportunities or needs, hardly in an attempt, to fully cover larger parts of the system. Overall, practically all States / agencies, have some experience with policy planning / foresight exercises, moreover, they have a good disposal of knowledge of parts of their economy. However, this 'systems intelligence' is to a high degree determined and biased from the respective experience and field of activity determined by the respective policy portfolio. Accordingly, many of the respective programmes and measures suffer from the bias of accumulated experience of the responsible institutions and actors, which leads to self-re-enforcing behaviour. At the same time, even worse, they leave behind blind spots.
- **Overloaded portfolio, too much orientation at thematic fields, saturated absorption capacity for further policy measures**. In the past, an orientation at specific technological fields or sectors have dominated policy planning at regional level. Seven out of nine States have implemented some sort of cluster policy, which are, without exception, characterised by a thematic orientation such as automotive, wood, plastics, ICT including new media and telecoms, food, life science, health technology. Due to the club character (a firm / institute has to agree a membership and has to pay membership fee), attention is mainly directed at maintaining a level of internal dynamics of the respective clubs at the cost of openness. The cluster initiatives can be considered as prototypes of general behaviour of policy actors as a direct outcome of a too large number of separated programmes, measures, and bigger projects. Last, but not least, both the number of policy actors as well as the respective target groups have reached their limits to adopt further policy actions. Future SF planning thus should be more aware of the capacity and organisational intelligence of the foreseen institutions to implement the respective actions.

Having stated these three reservations, which are, however, made from a high level of achievements, the following Exhibit 16 should be read with some caution, particularly when taking into account (i) the inadequate definition of regions, (ii) the patchwork of policy planning styles (with a too strong orientation at participatory processes aiming at the identification of opportunities for funding), and (iii) the sub-optimal allocation of SF measures (but also of Federal and State level measures) at too many separated activities with a too strong orientation at content (technological areas, sectors).

Exhibit 16: Factors influencing innovation potential by type of region

Region	Main factors influencing future innovation potential
Burgenland	• strengths: wine, tourist industry, particularly spas, awareness for 'sustainable' technologies (energy, esp. biomass, environment) • a commitment at innovation policy at the level of State government
Kärnten	• strengths in microelectronics, tourist industry • even more promising: general advancement of firms (increase productivity, improve product portfolio, support marketing / internationalisation) • growing knowledge based economy (Klagenfurt, Villach) (the Lake Side Incubator can be considered as an indicator) • openness to neighbouring regions
Niederösterreich	• strengths in the food, agriculture and viticulture sector • powerful, high performing firms here and there, but no strong clusters in a strict sense (notwithstanding the right policy, to address 'clusters' in a wide sense) • the Greater Vienna region (hardly perceived as an opportunity)
Oberösterreich	• strengths in many industrial sectors: metallurgical industry, chemical industry, plastics, strong automotive supplier industry and manufacturers (world class in motor cycles, fire engines), sports equipment, food, process technologies • growing endowment with public research infrastructure, particularly competence centres and strong academia-industry links
Salzburg	• tourist industry, some strong industrial firms both in the City of Salzburg as well as in the inner districts, however no dominating sectoral specialisation (except perhaps for wood) • emerging awareness and opportunities arising from conceiving tourism, leisure, wellness, sports, rehabilitation, health as an integrated sector and thus target for research, education / training and economic policy
Steiermark	• strong research-based industry in the Graz area • four universities and many applied research organisations (Joanneum Research, > 10 competence centres linking industrial with academic research) • strengths in the automotive sector, wood, food and beverages (esp. wine), metal producing industry, early adoption of nano technology, high awareness for 'sustainable' technologies (energy, environment)
Tirol	• strong tourist industry with unexploited opportunities to go abroad • emerging health (technology) sector including two specialised universities, several research institutes, a cluster initiative and a rather innovative health organisation, spin-off companies • the 'big five' companies in the field of high temperature metallurgy, gas engines, pharmaceuticals, optical instruments and jewellery, food are further unexploited opportunities for local clusters
Vorarlberg	• small, vibrant industrial sector (manufacturing, textile), open minded and export oriented • strong incubators (managed by a private-public-partnership approach) • highly developed human resource base
Wien	• **The** science and service sector of Austria: eight universities, strengths in life sciences and health ('Vienna Bio Centre'), ICT, creative industries

5.2 A prospective SWOT appraisal of regional innovation potential

This section complements the preceding one by highlighting bottlenecks in development of regional innovation potential, and summarizing the strengths, weaknesses, opportunities and threats of each region on its path towards knowledge-based development.

Region	Strengths, Weaknesses, Opportunities, and Threats
Burgenland	• **S:** quite favourable development of the Eisenstadt area in the past ten years in attracting and creating endogenously a high-tech sector • **W:** low level of commitment to RTDI policy in the States' government in the past, scattered economic structure (hardly any cluster, expect for wine, some agriculture and tourism) • **O:** increased cross-border collaboration with the Vienna Region as regards to the northern part of Burgenland, with Styria and Lower Austria in the southern part, with Hungary in general, shift in policy attention from the productive sectors to the service sector (tourism) and agricultural sector (wine) • **T:** (i) to consider the Burgenland as an economic and societal entity, (ii) to overemphasise the role of R&D (in a strict sense) and of the productive sectors
Kärnten	• **S:** strengths in microelectronics, tourist industry (both summer and winter) • **W:** considerable disparities between the centre (Klagenfurt, Villach) and the rural areas • **O:** general advancement of firms (increase productivity, improve product portfolio, support marketing / internationalisation), increasing awareness and actions to promote the knowledge based economy (Klagenfurt, Villach) (the Lake Side Incubator can considered as an indicator), exploiting the opportunities arising from the membership of Slovenia in the EU • **T:** politicization of innovation policy
Niederösterreich	• **S:** wine, food, agriculture; powerful, high performing firms here and there • **W:** (i) scattered policy actors arena (too many agencies, overcapacities, overlaps, weak visibility despite many PR activities), (ii) no strong **industrial** specialisation ('clusters' in a strict sense, however notwithstanding the right policy, to address 'clusters' in a wide sense) • **O:** (i) higher commitment to internationalisation (mainly cross-border), (ii) higher commitment to activate the opportunities arising from the Greater Vienna Region (despite of discouraging experiences in the past) • **T: (i)** one-eyed focus at the establishment of new and own research capacities at the cost of existing ones (particularly the Danube University Krems) or the active use of those in Vienna; main threats, however: (ii) politicization of overall economic policy, (iii) non-achievement of reducing the complexity of the actors' landscape [SF planning could help through reducing the variety of policies / measures / responsible actors]
Oberösterreich	• **S:** (i) dominance in many industrial sectors: metallurgical industry, chemical industry, plastics, strong automotive supplier industry and manufacturers (motor cycles, fire engines), sports equipment, food, industrial plant equipment, (ii) strengths amongst policy actors: professionally managed economic development agency (Technologie Marketing Gesellschaft, TMG) • **W:** a certain oversupply with 'policy offers' • **O:** "Let the people work!" (Cf. the previous and the following point.) • **T:** politicization of innovation policy in the recent past
Salzburg	• **S:** tourism, some strong industrial firms both in the City of Salzburg as well as in the inner districts • **W:** (i) no dominating sectoral specialisation (except tourism and perhaps for wood), (ii) a half-hearted RTDI policy • **O:** emerging awareness and opportunities arising from conceiving tourism, leisure, wellness, sports, rehabilitation, health as an integrated sector and thus target for research, education / training and economic policy • **T:** (i) failing to seize the opportunities outlined above due to disagreement

Region	Strengths, Weaknesses, Opportunities, and Threats
	amongst policy actors, (ii) long-term threats in the winter tourism due to declining snowfall in skiing resorts at altitudes lower than about 1800 m
Steiermark	• **S:** (i) strengths in many sectors / areas (research-based industry in the Graz area), automotive sector, wood, food and beverages (esp. wine), metal producing industry, early adoption of nano technology, high awareness for 'sustainable' technologies, (iii) strengths amongst policy actors: professionally managed economic development agency, RTDI policy is high on the agenda in the overall policy portfolio • **W:** disparities in some sub-regions with difficulties to gain ground (south-west, common border to Burgenland) • **O:** exploiting the strong science-base (including incubators), built up the last ten years (particularly the competence centres related cluster); a strict orientation at performance contracts could help to seize the opportunities and at the same time avoid the threat indicated below • **T:** a too strong overall orientation at 'high-tech'
Tirol	• **S:** (i) a strong tourism industry with unexploited opportunities to go abroad, (ii) health sector (including two universities, several research institutes, a cluster initiative and a rather innovative health organisation), (iii) the 'big five' companies (cf. above), (iv) policy level: lean policy actors (State Government, agency (Tiroler Zukunftsstiftung), quite efficient and visible • **W:** a certain separation of SF planning and RTDI policy in the past • **O:** (i) unexploited opportunities from the 'big five' for local clusters, (ii) further development of the health cluster, (iii) increased cross-border collaboration in policy making (esp. Salzburg, Southern Tyrol, Carinthia, Vorarlberg), despite some discouraging experiences in the past • **T:** as regards to the research-base and related industry a continuation of a too strong supply-oriented establishment of (intermediary) structures [performance contracts can help]
Vorarlberg	• **S:** (i) small, vibrant industrial sector (manufacturing, textile), open minded and export oriented, considerable high share of high-tech manufacturing, (ii) strong incubators (managed by a private-public-partnership approach), (iii) lean and effective agency (WISTO) • **W:** (i) weak endowment with public and private R&D, (ii) lack of critical mass amongst target groups for specialised measures • **O:** (i) further development of the quite good human resources potential, (ii) continue to create a research-education-training cluster around the Fachhochschule Vorarlberg, V-Research, incubators in the Dornbirn area • **T:** no serious threats
Wien	• **S: the** science and service sector of Austria: (i) eight universities, half of public research of Austria is located and performed in Vienna, (ii) strengths in life sciences and health ('Vienna Bio Centre'), ICT, creative industries, (iii) well managed agencies (ZIT, WWTF, WWFF), with a culture of collaboration • **W:** low share of industry in general and in high tech manufacturing in particular • **O:** (i) expand policy considerations at the Greater Vienna Region (particularly Lower Austria, but also the northern part of Burgenland), (ii) continue to exploit opportunities from the science base, financed and operated by Federal sources and institutions, (iii) exploit more actively the opportunities from innovation in services / public sector, urban infrastructures and related services • **T:** (i) competition from Bratislava [albeit being partner in the twin-city agreement] as a metropolis attracting head quarters from international firms, (ii) further migration of industrial firms, (ii) separation of policy making without reference to Federal policies, resources, and governance [actually, there is no real danger].

5.3 Conclusions: Regional innovation potential

This chapter concludes with key conclusions drawn from the analysis. Each conclusion is preceded by a 'policy headline'. The conclusions highlight differing levels and factors for innovation potential across the regions of the country.

Policy headline 1: Inadequate definition of regions

- Austria as a regional entity in the context of SF policy must be considered as a patchwork. Demarcation of regions and the definition of the political responsibility is made on the basis of the political-administrative division of labour, which are the Federal States. There are numerous cases, where the definition of regions in economic terms significantly differ from those based on political responsibilities and are in fact sub-optimal for the further development of the regions.
- In most cases seizing the regional innovation potential requires a wider definition of regions in terms of size of endowment with a minimal number of firms, institutions, relationships. In particular, the exclusion of the economic 'centres' has repeatedly impeded a sustainable development due to the (de facto) separation of actors in the respective centres.
- Future SF policy planning thus should question the politically determined concept of regions and put much effort at proper definition of regions. Realistically, it will lead to more trans-border cooperative arrangements in policy planning and implementation rather then the autonomous handling of cross-border regions.
- To sum up: A change in the demarcation of regions and respective policies could contribute to stronger impacts from SF policies and measures.

Policy headline 2: Mix of styles in policy planning: a too strong focus at bottom-up planning impedes riskier approaches with long-term character

- The most dominating approach towards policy planning at the States' level, is bottom-up, mainly through extensive involvement of stakeholders / beneficiaries. Mid-term evaluations have shown, that the too tight involvement of stakeholder repeatedly has lead to a sub-optimal portfolio of measures (too risk-averse, too broad, sub-critical size).
- A stronger orientation at bottlenecks and needs, and, generally, a stronger top-down approach, based on empirical evidence, will lead to measures with a higher degree of pertinence and impact.

Policy headline 3: Overloaded portfolio, saturated absorption capacity for further policy measures

- At the level of programmes and measures (Federal, State, and SF) the number of measures can exceed the hundred (per State). Both the number of policy actors as well as the respective target groups have reached the limits to adopt further policy actions. Future SF planning thus should be more aware of the following issues: (i) Capacity and organisational intelligence of the foreseen institutions should be adequate to implement the respective actions. In fact, it will be more important, to assess the capability of the foreseen institutions rather than (merely) the quality and appropriateness of the envisaged measures. (ii) SF measures should be agreed with and adjusted to the autonomous policies and measures both at the level of States as well as Federal level. Likewise, in most cases, the level of agreement and co-ordination has been sub-optimal. Again, the pertinence of the **portfolio** of

Federal, State and SF should be a top priority in future policy planning and related assessment.

Policy headline 4: Higher priority for structural approaches rather then addressing sectors / technology fields

- Traditionally, by referring to the existence of 'strengths' or 'clusters', specific sectors, clusters, and / or technology fields have been the targets of policy interventions such as wood, food, plastics, automotive, ICT, health, environmental technologies, micro and nano technologies. As a consequence, certain classes of firms have been addressed, while others have been left out. In doing so, innovation projects, in particular on a collaborative basis, have been and still are considered as the most appropriate vehicle for development. As regards to RTDI, future SF planning should, instead, put a stronger focus at an integrated approach by addressing the regional 'system of innovation'. In doing so, SF should not primarily address individual firms or networks of firms, rather it should preferably address bottlenecks in the wider system. This in fact requires a long-term perspective, which, by the way, fits quite well into the long-term character of SF planning. The fulfilment of two requirements are here essential: (i) SF planning should, as much as possible, be based on foresight exercises rather then bottom-up suggestions for individual measures. Thus, understanding problems and bottlenecks is more important than the availability of (often supply-side) solutions. (ii) SF planning should be explicitly adjusted to autonomous States' and Federal policies.

6 Future priorities for Structural Fund support for innovation and knowledge: options for intervention

The Austrian innovation system has changed in the last decade at a pace and quality, that, from an outside view, the observer will perceive two different countries rather than one country, which has improved to the better. The most significant changes are first of all the steep increase of RTDI expenditures from 1.54% in 1995 to 1.78% in 1998 and to 2.35% in 2005. Major parts of this increase has been produced by the business sector and in particular Austrian branches of foreign-owned companies. Austria is popular as a location for R&D facilities mainly because it offers highly qualified scientists and engineers as well as proximity to universities and key customers.

The second pattern of change arises from a tremendous change in the policy culture and in the related institutional framework. Specifically, both at Federal as well as States' level, a process of 'agencification' took place. This process went hand in hand with the implementation of programmes as the most appropriate vehicle for policy delivery. Last, but not least, the establishment of the Austrian Council [Rat für Forschung und Technologieentwicklung], and the fusion of several specialised agencies to two major agencies (Austria Wirtschaftsservice Gesellschaft (AWSG) and Forschungsförderungsgesellschaft (FFG)) contributed much to the completion of the institutional framework. Since then, explicit policy planning is an essential part of the overall policy culture. As regards to the relationship between the Austrian Council and the Federal States, things have not been settled so far, however, first steps have been done and next steps are under preparation. Particularly, the role of Structural Funds in future RTDI policy has not been high on the agenda.

6.1 Strategic orientations for Structural Fund investments in innovation and knowledge

Key conclusion 1 : No further investment in innovation and knowledge, unless it is adjusted with autonomous States' and Federal strategies and measures

One of the most striking lessons which could be learned during the last few years is the increasing overload with policy measures as well as with policy actors. Further public investments in innovation and knowledge per se is no more justified, unless it is adjusted with autonomous States' and Federal strategies and measures. Furthermore, some States, respectively their economies have achieved a certain saturation with public support for RTDI.

Recommendation 1 : Future SF policy planning should explicitly refer to State and Federal policies and measures

In the past, a separation between SF planning and States and Federal policy planning could be observed throughout. Particularly, Federal RTDI policy (and, furthermore, deliberations on the 7th framework programme) and SF considerations are far from being conceived as mutually related.

Future SF policy planning thus should be carried out by explicit and extensive reference to past, on-going, and future policies, related measures, target groups, etc. at States' and Federal level in order to optimise the respective portfolio of policies and measures.

Furthermore, the institutions, responsible for planning and implementation of SF programmes should have the capability, to meet the respective requirements to perform policy planning and policy implementation. Particularly, they should have at least a workable relationship to the major federal agencies in charge of executing federal policy. Pragmatically, as a standard, the regional development agency of the respective States should be the first choice in the selection of the implementing body.

Key conclusion 2 : Future SF planning should mainly be driven by understanding the problems and requirements of (regional) innovation systems

In the past, not the least through extensive involvement of stakeholders (which undoubtedly is a merit of its own right), SF programmes to a large extent have been opportunity driven. Since stakeholders often are themselves public institutions, many of the policies and measures have turned out as supply dominated.

Recommendation 2 : Aim at understanding problems and bottlenecks in the regional innovation system, reduce number of measures

Future SF planning should be based on thorough understanding of the problems and bottlenecks in the regional innovation system including possible shortcomings of the institutional framework. By referring to the overall portfolio of policies and measures, SF can contribute to assure a higher level of completeness and pertinence of the required actions.

Particular emphasis should be put on reducing the number of measures and actions, which automatically supports the targeting at more 'systemic' issues.

Key conclusion 3 : Regions in economic / societal terms do not end up at the borders of States, eligible regions are often too small

It has been observed, that the political-administrative definition of policies and measures often does not meet the requirements of a given region as an economic / societal entity. Even more, within the political-administrative demarcation of 'eligible regions' are often too small and sometimes even arbitrary.

Recommendation 3 : Collaborative programmes between States, delegation of selected programmes to Federal agencies

A gradual improvement should and could be achieved through collaboration between States (which is already taking place, particularly and from good reasons, in cluster initiatives). However, it would be worthwhile to consider inter-state programmes as a constitutional entity of future SF policy. Even more, it could be worthwhile, to hand over some programmes to Federal agencies, particularly to the Austria Wirtschaftsservice Gesellschaft (AWSG) and the Forschungsförderungsgesellschaft (FFG). As a side effect, these two agencies could benefit from working with a

regional focus. By doing so, a certain gap, which exists between the Federal agencies and the States' agencies, could be overcome.

As regards to the observed smallness of 'eligible regions', a top-down approach, deriving and justifying policies from the characteristics and bottlenecks in the regional innovation systems will undoubtedly contribute to overcome this shortcoming. Specifically, it will be possible, where useful, to involve the respective 'centres'.

6.2 Operational guidelines to maximising effectiveness of Structural Fund interventions for innovation and knowledge

Key conclusion 4 : Future SF planning should primarily address strengthening organisations and institutions rather than carrying out projects

Projects are omnipresent, as they are the currency in the world of programmes. As a matter of fact, project appraisals often have a bias favouring the project (of its own right) rather than to assess the project in the light of the needs, requirements and capabilities of the respective organisation(s).

Recommendation 4 : Changes in the appraisal of projects favouring organisations

Particular emphasis should be put on strengthening firms / organisations / institutions rather than on the delivery of projects. Accordingly, assessing the projects in the wider context of the capabilities and context of the respective organisations should be the guideline for project appraisal rather than the quality of the projects on their own right. As a direct consequence of strengthening organisations, people will come to heart of measures.

Key conclusion 5 : Rolling out public organisations

In the past, both SF as well as well as Federal and States' policies have created lots of institutions under the governance of the public sector. The most obvious examples, funded by SF money, are incubator units, but also competence centres. Likewise, most of the regional development agencies are running units or providing services which could equally, even better performed on a private basis.

Recommendation 5: Identifying candidates for roll-out

Since a great deal of agency-type institutions are positioned at the public-private interface, a should be carried out in order to identify candidates for privatisation. Incubators, some competence centres, but also parts of cluster initiatives or business advisory actions are promising candidates. Such a type of 'cleaning' can contribute to strengthen the business sector in terms of size and structure. At the same time it contributes to make agencies leaner, which should be high on the agenda at least for half of the States.

Key conclusion 6 : SF should refrain as much as possible to establish new types of schemes

Austria has the best of everything. There is literally no need for further schemes and types of measures. Rather it will be necessary, (i) to clean up and reduce variety and number of measures and of organisations, and (ii) to reverse the mode of justification and thus turning supply-side dominance into orientation at the needs of the (regional) innovation system.

The most dominant issue is thus promoting the **access** to existing resources in a wide sense (helping firm as partners for collaboration; to access remote research institutions looking out both for people and technological advice; funding opportunities; distribution channels, etc.). Again, the issue of strengthening the policy delivery capabilities (mainly of agencies) is more important than the question for the proper policy mix.

Recommendation 6 : Strengthen the policy supply capabilities

Future SF policy planning should put most emphasis on the availability and qualification of adequate policy supply capabilities. The first choice are here the respective agencies at State level. They have to be properly endowed with staff (need not be high in terms of number), access to networks (cannot be overestimated), a high degree of independence from government in the operational business (while having at the same time strong contractual and supervisory ties), and a highly developed culture to distinct between public and private. Having 'various' agencies is by no means acceptable (taking into account the fact, that an average Austrian State is smaller than 1 million inhabitants).

Appendix A Methodological annex

A.1 Quantitative analysis of key knowledge economy indicators

A 1.1 Factor analysis

In order to analyse and describe the knowledge economies at regional level in the EU, the approach adopted was to reduce and condense all relevant statistical information available for a majority of regions. The approach involved firstly reducing the information from a list of selected variables (Table 1) into a small number of factors by means of factor analysis.

Table 1. Reduction of the dataset (215 EU-27 regions) into four factors by means of factor analysis

	The 4 factors			
	F1 'Public Knowledge'	F2 'Urban Services'	F3 'Private Technology'	F4 'Learning Families'
Higher education (HRSTE), 2003	**.839**	.151	.190	.184
Knowledge workers (HRSTC, core), 2003	**.831**	.164	.267	.327
High-tech services employment, 2003	**.575**	.367	.428	.323
Public R&D expenditures (HERD+GOVERD), 2002	**.543**	.431	.275	-.195
Value-added share services, 2002	.323	**.869**	.002	.121
Value-added share industry, 2002	-.265	**-.814**	.386	-.061
Employment government administration, 2003	-.217	**.745**	.124	-.175
Population density, 2002	.380	**.402**	.043	.038
High and Medium/high-tech manufacturing employment, 2003	-.073	-.331	**.873**	-.089
Value-added share agriculture, 2002	-.222	-.350	**-.672**	-.198
Business R&D expenditures, 2002	.335	-.050	**.664**	.267
S&T workers (HRSTO, occupation), 2003	.560	.178	**.589**	.382
Population share under 10 years of age, 2001	-.237	.060	-.015	**.868**
Life-long learning, 2003	.472	-.009	.165	**.703**
Activity rate females, 2003	.418	-.227	.281	**.620**

Note: Principal Component Analysis. Rotation Method: Equamax with Kaiser Normalization, a Rotation converged in 9 iterations. Main factor loadings are highlighted in bold. Source: MERIT, based on Eurostat data, mostly referring to 2002 or 2003

Based on the variable with the highest factor loadings we can characterise and interpret the four factors and give them a short symbolic name:

Public Knowledge (F1)

Human resources in Science and Technology (education as well as core) combined with public R&D expenditures and employment in knowledge intensive services is the most important or common factor hidden in the dataset. The most important variables in Public Knowledge are the education and human resource variables (HR S&T education and core). Cities with large universities will rank high on this factor. One interesting conclusion is that public and private knowledge are two different

factors (F1 and F3 respectively), which for instance has implications for policy issues regarding Science-Industry linkages. Public R&D and higher education seems especially related to high-tech services, whereas Business R&D especially serves high- and medium-high-tech manufacturing.

Urban Services (F2)

This second factor contains information on the structure of the economy. It is well known that industrial economies are quite different from services based economies. It is not a matter of development per se, because in the European regions the variety of economic structure is very large and for a large part based on endowments and path dependent developments like the extent to which government administration is located in a region or not. This factor takes into account the differences between an industrial area and a service based area including the public administration services of the government. Another observation is that there are two different 'urban' factors, indicating that academic centres not necessary co-locate with administration centres. What may not be surprising is that the Urban Services factor is not associated with R&D, since R&D is more relevant for innovation in manufacturing than for service industries.

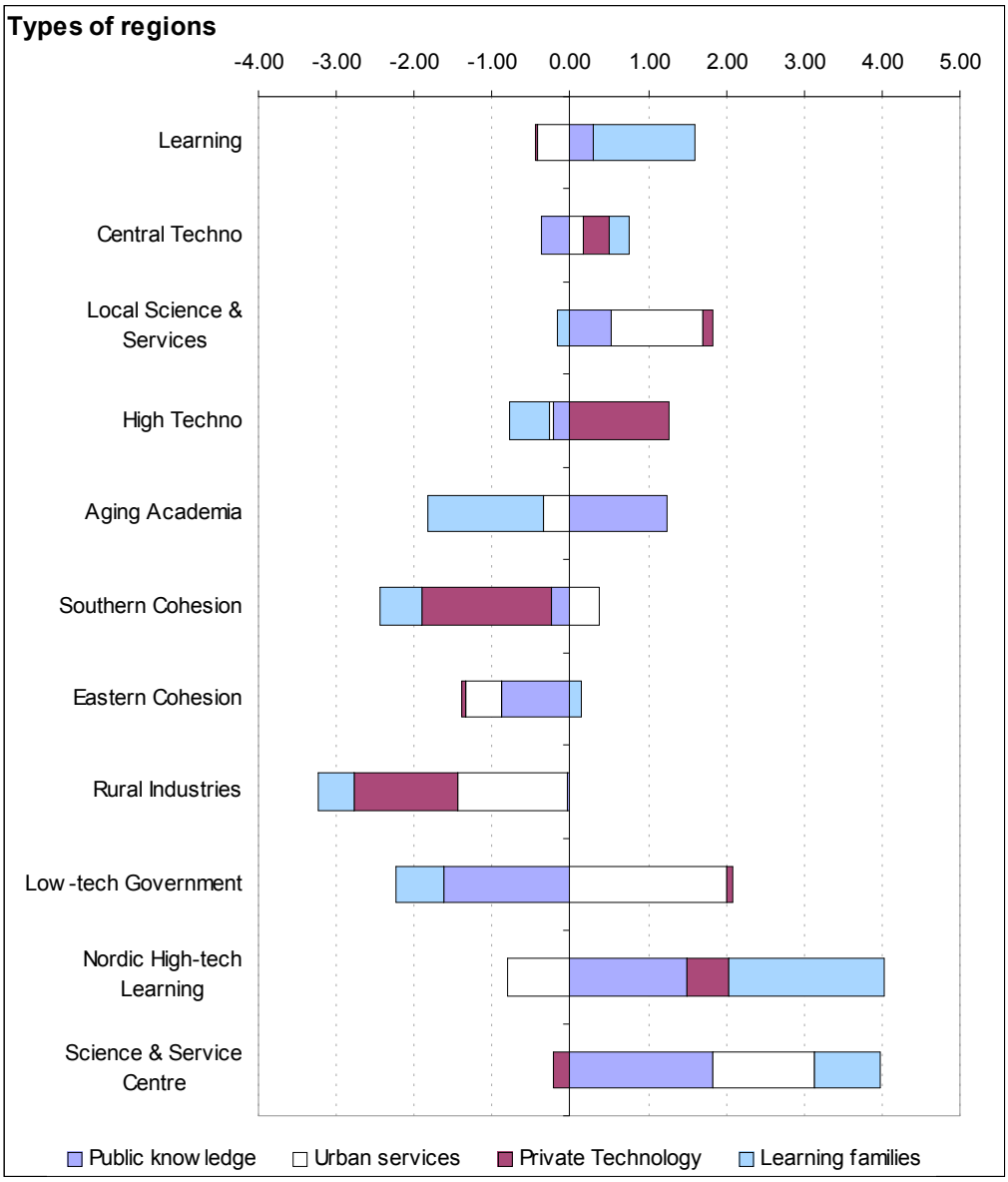
Private Technology (F3)

This factor contains business R&D, occupation in S&T activities, and employment in high- and medium-high-tech manufacturing industries. A countervailing power is the existence of agriculture in the region. One interpretation could be that agricultural land-use goes at the cost of possibilities of production sites. Another interpretation is that agriculture is not an R&D intensive sector.

Learning Families (F4)

The most important variable in this factor is the share of the population below the age of 10. Locations with relatively larges shares of children are places that are attractive to start a family. Possibilities for Life Long Learning in a region seems associated with the lively labour participation of the mothers of these youngsters. The Learning Families factor could also be interpreted as an institutional factor indicating a child-, learning- and participation- friendly environment, or even a 'knowledge-society-life-style' based on behavioural norms and values that are beneficial to a knowledge economy.

A 1.2 Description of the 11 types of EU regions



1 Learning

The Learning regions are first of all characterised by the high score on the factor 'Learning Families', and the three main components of this factor: life-long-learning, youth and female activity rate. On the other factors the regions are close to the regional average. Unemployment is on average the lowest compared to the other EU regions. Employment in the government sector is limited. GDP per capita is rather high. The regions are located in Austria, Ireland, the Netherlands, Sweden and the UK. There are many similarities with the Nordic High-tech Learning regions, but the business sector in the Nordic version invest more in R&D.

2 Central Techno

This is a rather large group of regions located mostly in Germany and France with close to average characteristic, but the share of High-tech manufacturing is rather

high. The factor-scores as well as GDP-per head is slightly above the regional average, except for the Public Knowledge factor which is slightly lower.

3 Local Science & Services

This group of regions with diverse nationality consist mainly of capital cities, such as Madrid, Warsaw, Lisbon, Budapest and Athens. These urban area's serve as national centres for business services, government administration, public research institutes and universities. Urban Services and Public knowledge are therefore the strongest factors for this type of region. GDP per capita is on average slightly below the EU25 average, but growing. The low score on life-long-learning is a weakness in most Local Science & Services regions, especially compared to the more wealthy and advanced Science & Service Centres.

4 High Techno

The High Techno regions host many high-tech manufacturing industries. They are mostly located in Germany (e.g. Bayern and Baden-Wurtemberg), some in Italy (e.g. Lombardia and Veneto) and two French regions. This type is very strong in Private Technology and has a high level of GDP per capita. The factors Public Knowledge and especially the Learning Family factor shows a relative weakness, e.g. in life-long-learning. Growth in terms of GDP per capita has been low and unemployment didn't improve much in the previous years.

5 Aging Academia

This group of regions is mostly located in East-Germany and Spain and also includes the capital regions of Bulgaria and Romania. The strength in the Public Knowledge factor is mostly based on the high share of people with tertiary education. The low score on the Learning Family factor is due to little life-long-learning and hosting relatively few children. The unemployment situation has improved, but is still very high.

6 Southern Cohesion

Southern cohesion regions are located in Southern Europe, consisting of many Greek, some Spanish and two Portuguese regions. The low score on the Private Technology factor is striking. There is hardly any high-tech manufacturing nor business R&D. Services is the most important sector, but also agriculture is still a rather large sector. The share of manufacturing industry in value added is very limited. Population density is low, but on average it has been increasing.

7 Eastern Cohesion

Manufacturing industries is the dominant sector, whereas services and agriculture are rather small sectors. This type of region is mostly located in Poland, Czech Republic, Hungary and Slovak Republic. Two Portuguese regions are also included. The Public Knowledge factor is the main weakness of this type of regions. However, the score on the Private Technology factor is close to average, which means that it is much stronger in this respect than the Southern Cohesion regions. Unemployment is high, even compared to Rural Industries and Southern Cohesion regions.

8 Rural Industries

Besides a low per capita GDP, Rural Industries regions have in common a low score on both the factors Urban Services and Private Technology. Population density is

very low. The service sector is often very small. Especially agriculture but also manufacturing industries are relatively large sectors. Besides regions in Bulgaria and Romania and Greece, there is also a more nordic sub-group consisting of Estonia, Lithuania and Itä-Suomi

9 Low-tech Government
This type of region, mostly located in southern Italy is characterised by a very low score on Public Knowledge combined with a high share of employment in the Government sector. Unemployment is severe, on average comparable to Eastern Cohesion regions. GDP per capita is however close to the regional average.

10 Nordic High-tech Learning
The Nordic version of the learning regions are typically strong in the Learning Family factor, but this type also has by far the highest business R&D intensity. In contrast with the popular characterisation of Nordic societies, the size of the government administration is the lowest of all the types. The low score on Urban Services is also due to the low population density. A rather unique feature of this type of regional knowledge economy is the combined strength in both the Public Knowledge and the Private Technology factor.

11 Science & Service Centre
The main characteristics of this urban group of regions are the high scores on the Public Knowledge and Urban Services factors. Population density is very high. This type also has the highest GDP per capita and productivity. The variables that are captured by the factor Learning Families also show a score above the regional average, but disappointing is the relatively low presence of high and medium-high-tech manufacturing and the business R&D intensity.

A.2 Qualitative analysis and preparation of country reports

In summary, the country reports were prepared in the following stages:

A first country document was prepared by the core study team in the form of a **template country report**. It contained overall guidance to the country experts and included a number of pre-filled tables, graphs and analysis sections based on information available at EU level.

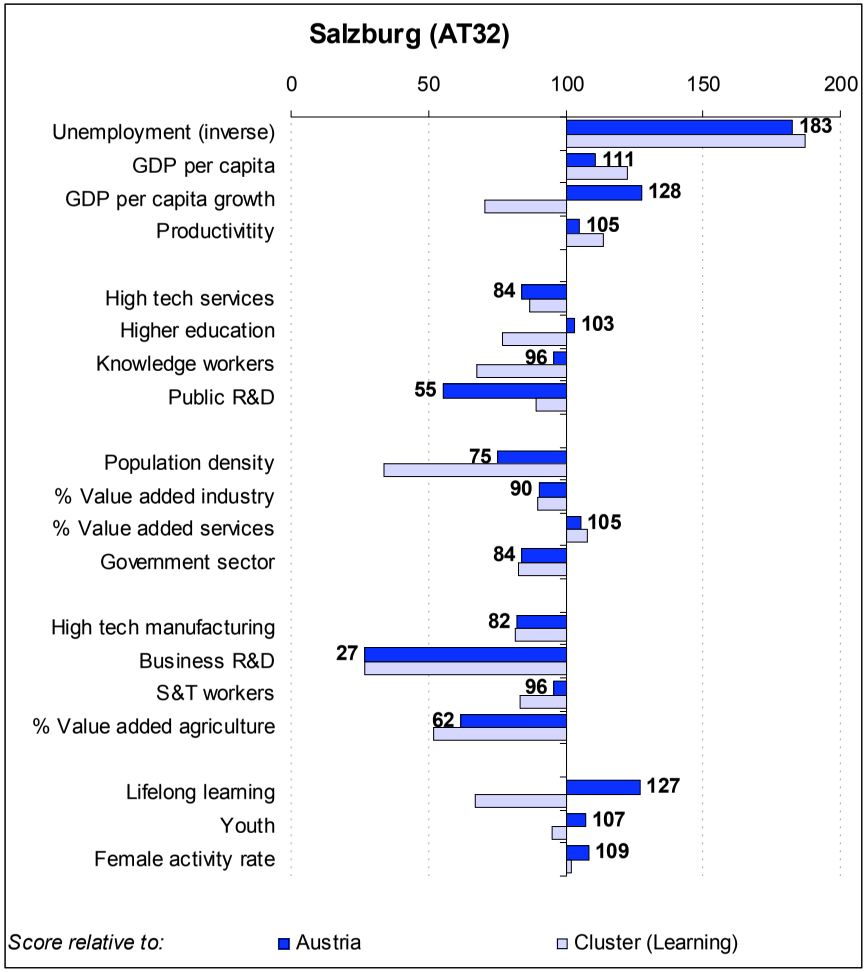
Next, the core team members and the national experts who were involved in the pilot phase of the project commented completed elements of the templates. Drafted elements and templates were completed and compiled into **first country briefings (draft pilot reports)** by the national experts involved in the pilot phase of the project. These pilot country reports were prepared by experts for Belgium, Greece, Italy, France, and Poland.

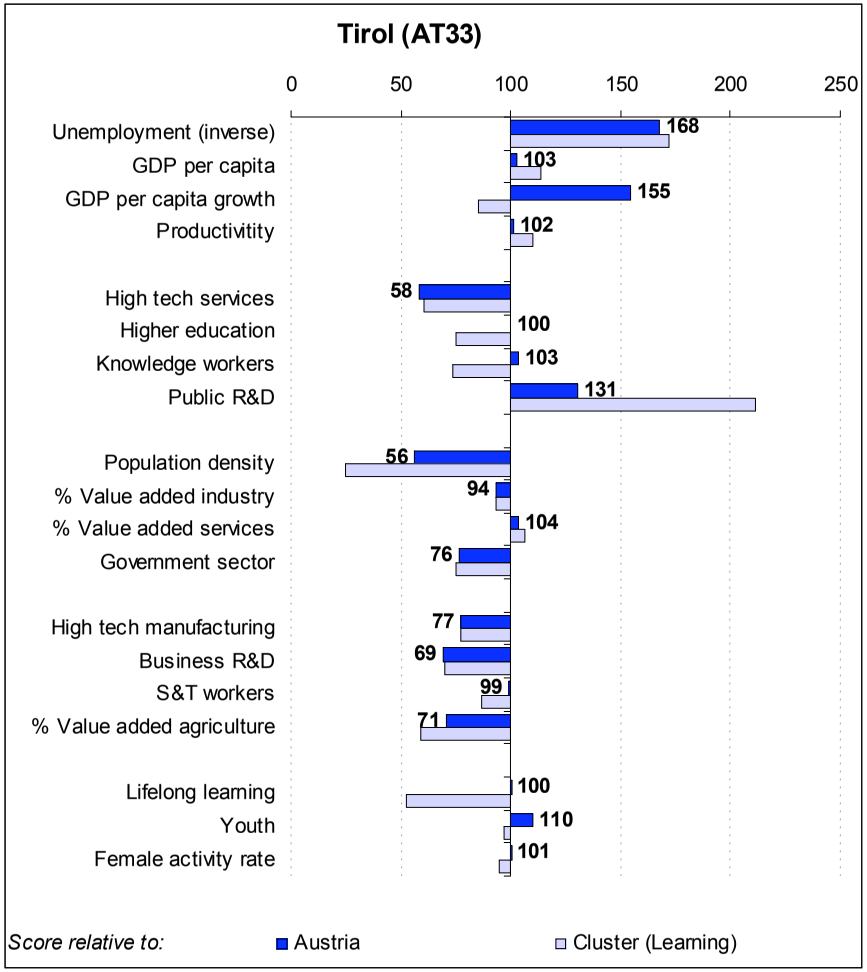
Once the five first country briefings were completed, a **final set of guidelines** was prepared by the core team. These guidelines were agreed with the Commission services responsible for this evaluation. Prior to this, all first country briefings were reviewed during the January 2006 and presented to a first meeting of the scientific committee.

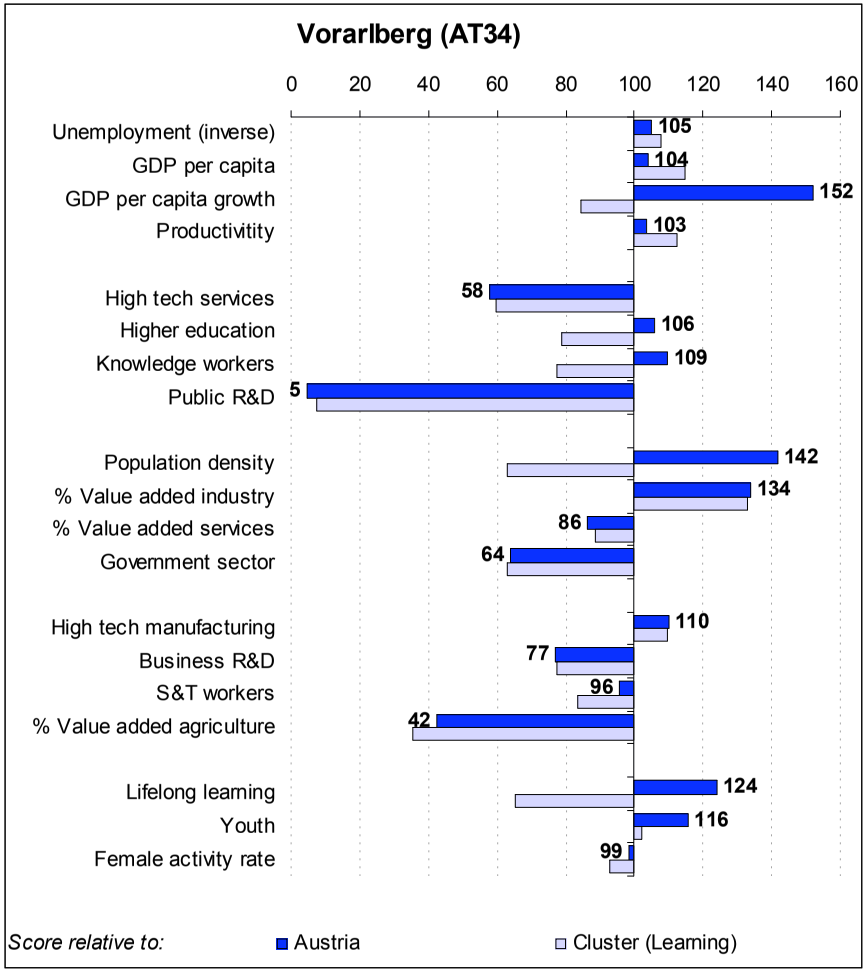
The work during the **country analysis phase** included:
Undertaking a series of key interviews (KI) with policy decision makers;
Organising a focus group (FG) with key national or regional RDTI stakeholders;
Collecting additional information and finalising short case studies; and
Preparing the synthesis notes of these various activities.

The above-mentioned work served as qualitative data and allowed the national experts to compile the draft **country reports**. All reports were subsequently reviewed, checked and finalised by the core team and the consortium members. Once this first check was completed, the core team organised a final peer reading of the document to verify its overall consistency and to ensure a final English language editing of the document. The core team then completed the final editing and layout of the document with a view to publication.

An overall synthesis report of all has been prepared and will be published by the European Commission providing an overview of the issues addressed in each of the 27 country reports produced by the evaluation team.


Salzburg (AT32)
0
50
100
150
200
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
183
111
128
105
84
103
96
55
75
90
105
84
82
27
96
62
127
107
109
Score relative to:
Austria
Cluster (Learning)


Tirol (AT33)
0
50
100
150
200
250
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
168
103
155
102
58
100
103
131
56
94
104
76
77
69
99
71
100
110
101
Score relative to:
Austria
Cluster (Learning)


Vorarlberg (AT34)
0
20
40
60
80
100
120
140
160
Unemployment (inverse)
GDP per capita
GDP per capita growth
Productivitity
High tech services
Higher education
Knowledge workers
Public R&D
Population density
% Value added industry
% Value added services
Government sector
High tech manufacturing
Business R&D
S&T workers
% Value added agriculture
Lifelong learning
Youth
Female activity rate
105
104
152
103
58
106
109
5
142
134
86
64
110
77
96
42
124
116
99
Score relative to:
Austria
Cluster (Learning)

B.3 Evolution of Gross Domestic R&D expenditures/GDP: Austria

Financing sectors	1998	1999	2000	2001	2002	2003	2004	2005
Gross Domestic Expenditures on R&D [MEUR]	3,400	3,762	4,029	4,393	4,684	4,975	5,246	5,774
of which financed by								
federal government	1,098	1,201	1,225	1,351	1,362	1,395	1,567	1,741
states	142	206	249	280	171	291	304	329
corporate sector	1,418	1,545	1,684	1,835	2,091	2,185	2,320	2,480
abroad	685	739	800	863	1,002	1,044	1,092	1,159
others	57	71	70	64	58	59	62	65
nominal GDP [bln EUR]	192.4	200.0	210.4	215.6	221.0	226.1	235.0	245,5
Gross Domestic Expenditures on R&D [% of GDP]	1.77	1.88	1.91	2.04	2.12	2.20	2.27	2.35

Source: Austrian Research and Technology Report 2005, op cit
NB: Status as of 21 April 2005

Appendix C Categories used for policy-mix analysis

C.1 Classification of policy areas

Policy area	Short description
Improving governance capacities for innovation and knowledge policies	Technical assistance type funding used by public authorities, regional agencies and public-private partnerships in developing and improving policies and strategies in support of innovation and knowledge. This could include past ERDF innovative action programmes as well as support for instance for regional foresight, etc.
Innovation friendly environment;	This category covers a range of actions which seek to improve the overall environment in which enterprises innovate, and notably three sub groups: innovation financing (in terms of establishing financial engineering schemes, etc.); regulatory improvements and innovative approaches to public services and procurement (this category could notably capture certain e-government investments related to provision of services to enterprises) ; Developing human capital for the knowledge economy. This category will be limited to projects in higher education aimed at developing industry orientated courses and post-graduate courses; training of researchers in enterprises or research centres[23];
Knowledge transfer and technology diffusion to enterprises	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.
Innovation poles and clusters	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.

[23] This is part of the wider area of in-house training, but in the present study only the interventions targeted to researchers or research functions will be analysed.

Policy area	Short description
	indirect support through funding for regrouping R&D infrastructure in poles, infrastructure for clusters, etc.
Support to creation and growth of innovative enterprises	Direct or indirect support for creation and growth of innovative firms: direct support: specific financial schemes for spin-offs and innovative start-ups, grants to SMEs related to improving innovation management, marketing, industrial design, etc.; indirect support through funding of incubators, training related to entrepreneurship, etc.
Boosting applied research and product development	Funding of "Pre-competitive development" and "Industrial research" projects and related infrastructure. Policy instruments include: aid schemes for single beneficiary or groups of beneficiaries (including IPR protection and exploitation); research infrastructures for non-profit/public organisations and higher education sector directly related to universities.

C.2 Classification of Beneficiaries

Beneficiaries	Short description
Public sectors	Universities National research institutions and other national and local public bodies (innovation agencies, BIC, Chambers of Commerce, etc..) Public companies
Private sectors	Enterprises Private research centres
Networks	cooperation between research, universities and businesses cooperation between businesses (*clusters of SMEs)* other forms of cooperation among different actors

C.3 Classification of instruments

Instruments	Short description
Infrastructures and facilities	Building and equipment for laboratories or facilities for university or research centres, Telecommunication infrastructures, Building and equipment for incubators and parks for innovative enterprises
Aid schemes	Grants and loans for RTDI projects Innovative finance (venture capital, equity finance, special bonds, etc.) for innovative enterprises
Education and training	Graduate and post-graduate University courses Training of researchers

Appendix D Financial and policy measure tables

D.1 Additional financial tables

D 1.1 RTDI plus business (innovation technology) support

Categories 181 to 184 plus
152 Environment-friendly technologies, clean and economical energy technologies
153 Business organisation advisory service (including internationalisation, exporting and environmental management, purchase of technology)
155 Financial engineering
162 Environment-friendly technologies, clean and economical energy technologies
163 Enterprise advisory service (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology)
164 Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs)
165 Financial engineering

Overall allocation of resources at objective 1 and 2 level to RTDI interventions and total [EUR] (enlarged definition of RTDI) (3rd calculation)

Objective	Total cost	SF			NF	
		Total	ERDF	ESF	Public	Private
RTDI INTERVENTIONS						
Objective 1	164.321.581	58.295.914	58.295.914	0	15.653.895	90.371.773
Objective 2	1.060.079.867	268.755.141	268.755.141	0	215.388.480	575.936.245
TOTAL COHESION POLICY						
Objective 1	889.251.238	282.906.141	181.519.085	57.440.139	106.664.845,00	499.680.252
Objective 2	3.865.382.660	733.529.487	705.603.606	27.925.881	583.631.246,00	2.548.221.927

Source: programming documents and financial data provided by DG REGIO

Absorption capacity by field of intervention within the area of RTDI (enlarged definition) (3rd calculation)

Codes	allocated	disbursed	expenditure capacity
OBJECTIVE 1			
162 - Environment-friendly technologies, clean and economical energy technologies (only for SMEs)	2.992.621	786.305	26,3%
164 - Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)	21.549.783	13.927.508	64,6%
165 - Financial engineering (only for SMEs)	14.534.567	7.300.800	50,2%
181 - Research projects based in universities and research institutes	7.238.251	4.112.666	56,8%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	6.419.011	3.331.840	51,9%
183 - RTDI infrastructure	2.983.600	1.898.930	63,6%
322 - Information and Communication Technology (including security and safe transmission measures)	664.343	248.045	37,3%
324 - Services and applications for SMEs (electronic commerce and transactions, education and training, networking)	1.913.738	887.246	46,4%
Total objective 1	**58.295.914**	**32.493.340**	**55,7%**
OBJECTIVE 2			
152 - Environment-friendly technologies, clean and economical energy technologies (only for large enterprises)	2.525.140	1.196.664	47,4%
153 - Business advisory services (including internationalisation, exporting and environmental management, purchase of technology) (only for large enterprises)	2.031.700	801.574	39,5%
162 - Environment-friendly technologies, clean and economical energy technologies (only for SMEs)	40.243.210	19.147.156	47,6%
163 - Business advisory services (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology) (only for SMEs)	15.882.407	7.157.435	45,1%
164 - Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs) (only for SMEs)	79.456.726	34.597.386	43,5%
165 - Financial engineering (only for SMEs)	178.920	105.329	58,9%
181 - Research projects based in universities and research institutes	19.708.005	9.078.501	46,1%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	94.378.343	50.587.626	53,6%
183 - RTDI infrastructure	11.955.498	3.359.323	28,1%
322 - Information and Communication Technology (including security and safe transmission measures)	479.064	302.336	63,1%
324 - Services and applications for SMEs (electronic commerce and transactions, education and training, networking)	1.916.128	604.671	31,6%
Total objective 2	**268.755.141**	**126.938.002**	**47,2%**

Source: programming documents and financial data provided by DG REGIO

D 1.2 Broad innovation and knowledge economy funding

This third calculation adds RTDI plus business (innovation & technology) support plus information society. As D.1.1 plus:
322 Information and Communication Technology (including security and safe transmission measures)
324 Services and applications for SMEs (electronic commerce and transactions, education and training, networking)

There is actually no significant difference between this definition (including information society) and the prior one, as information society issues amounts to mere

4,4% in the objective 1 region and 0.9% in the objective 2 region (cf. **Erreur ! Source du renvoi introuvable.**).

D.2 Summary of key policy measures per programme

D.2.1. Main measures in favour of innovation and knowledge

Identified RTDI measure or major project	Focus of intervention (policy areas classification)*	Main Instruments**	Main beneficiaries***
Burgenland			
1. Crafts and industry			
Support of SMEs	5	Aid schemes	Private sectors
Infrastructures in priority areas	4	Infrastructures and facilities	
Telecommunication networks & applications	2	Infrastructures and facilities	Private sectors
Creation of instruments to support the equity capital of SMEs	4	Aid schemes	Private sectors
2. Research, technology, and innovation			
Clusters and competence centres	2, 4, 5	Infrastructures and facilities	Private sectors, Networks
Incubators and Universities of Applied Sciences	3, 5	Aid schemes	
Innovative services	3	Aid schemes	Private sectors
R&D projects	3, 5	Aid schemes	Private sectors
Kärnten			
1. Crafts, industry and production-related services			
Innovative investments	3	Aid schemes	Private sectors
Research and development	3,5	Aid schemes	Private sectors
Innovative soft measures (consulting, clusters, incubators, etc)	3, 4	Aid schemes	Private sectors, Networks
Environment and pilot projects (investments in environmental protection, corporate development)	3	Aid schemes	Private sectors
Niederösterreich			
1. Mobilisation of endogenous potentials for regional development, firm-related infrastructure, and pilot projects (including technology infrastructure and -transfer)	3		
2. Development of the crafts and industrial sector, innovation and technology			
Growth and improvement of existing firms	4	Aid schemes	Private sectors
Firm set-up and (foreign) direct investment	4	Infrastructures and facilities	Private sectors
Research and development	5	Aid schemes	Private sectors
Pre-competitive development		Aid schemes	

Inter-firm-co-operation, market development	3, 4	Aid schemes	Private sectors, Networks
Soft measures aiming at the craft and industrial sectors	3	Aid schemes	Private sectors
General business consulting, innovation consulting, consulting of newly created firms	3	Aid schemes	Private sectors
Environmental management, ecologically oriented consulting	3	Aid schemes	Private sectors
Oberösterreich			
1. Business-related infrastructure (including tourism)			
Research and competence centres, seminar centres	3, 5	Infrastructures and facilities	Public sectors, Networks
Infrastructure: Technology, cooperation, networking, marketing, telematics	2, 4	Infrastructures and facilities	Public sectors, Networks
2. Crafts, industry, services, and tourism			
Support of research, development, and innovation	4, 5	Aid schemes	Private sectors
Immaterial support of companies in the crafts, industry, and services sector to increase cooperation, networking, and use of ICT, marketing	3, 4	Aid schemes	Private sectors
Support of young businesses in their firm-start-up in all sectors	4	Aid schemes	Private sectors
Support of firm-start-up and growth	4	Aid schemes	Private sectors
Support of settlement and re-location of firms, improvement of related infrastructures	4	Infrastructures and facilities	Private sectors
Salzburg			
2. Productive sector and production-related service sector			
Research, development, and innovation projects	3, 5	Aid schemes	Private sectors
Innovative investments for firm set-up, firm settlement, particularly for SMEs	4	Aid schemes	Private sectors
Support of firm set-up	4	Aid schemes, Infrastructures and facilities	Private sectors
Cooperation and innovation projects	4, 5	Aid schemes	Private sectors, Networks
Steiermark			
1. Support of productive and service sectors			
Settlement and re-location of firms	4	Infrastructures and facilities	Private sectors
Firm set-up	4	Aid schemes, Infrastructures and	Private sectors

		facilities	
Modernisation of enterprises	3, 5	Aid schemes	Private sectors
Set-up and modernisation of small firms	3, 4, 5	Aid schemes	Private sectors
2. Support of competitive locations and preparation for the information society			
Establishment and further enlargement of 'Impulse Centres' (= incubators)	4	Infrastructures and facilities	Public sectors
Inter-firm R&D&I		Aid schemes	Private sectors, Networks
R&D&I within firms	5	Aid schemes	Private sectors
Networks, advise and knowledge transfer	3	Aid schemes	Private sectors, Networks
Consulting for SMEs	3, 4	Aid schemes	Private sectors
Tirol			
1. Firm aid, increasing the attractiveness of the business location, new technologies			
Investments in industrial firms	3	Aid schemes	Private sectors
Investments in small crafts and service firms	3	Aid schemes	Private sectors
Young businesses	4	Aid schemes	Private sectors
Real estate development for crafts and industry	4	Infrastructures and facilities	Private sectors
R&D in firms	5	Aid schemes	Private sectors
Consulting services to SMEs	3, 4	Aid schemes	Private sectors
Vorarlberg			
1. Sustainable firms			
Investments to support structural change	3, 5	Aid schemes	Private sectors
R&D in the crafts and industry sector	5	Aid schemes	Private sectors
Wien			
1. Development of local urban structures			
2. Competitive firms as preconditions for job creation			
Services	3	Aid schemes	Private sectors
Support of SMEs	3, 4	Aid schemes	Private sectors
Research	5	Aid schemes	Private sectors
R&D infrastructures	3, 4	Infrastructures and facilities	Public sectors

* Classification of RTDI interventions: (1) Improving governance capacities for innovation and knowledge policies; (2) Innovation friendly environment; (3) Knowledge transfer and technology diffusion enterprises; (4) Innovation poles and clusters; Support to creation and growth of innovative enterprises; (5) Boosting applied research and product development (see appendix).
**Classification of instruments: Infrastructures and facilities; Aid schemes; Education and training.
***Classification of Beneficiaries: Public sectors; Private sectors; Networks
Main source: OPs, evaluation reports, annual implementation reports, etc.

Appendix E Further reading

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List of useful websites at national or regional level

State Governments

Burgenland
www.bgld.gv.at

Kärnten
www.ktn.gv.at

Niederösterreich
www.noel.gv.at/Landesentwicklung/Landesentwicklung.htm

Oberösterreich
www.land-oberoesterreich.gv.at/cps/rde/xchg/SID-3DCFCFC3-B0A489DF/ooe/hs.xsl/17892_DEU_HTML.htm

Salzburg
www.salzburg.gv.at/raumplanung

Steiermark
www.raumplanung.steiermark.at/

Tirol
www.tirol.gv.at/raumordnung

Vorarlberg
www.vorarlberg.at/vorarlberg/bauen_wohnen/bauen/raumplanung/start.htm

Wien
www.wien.gv.at/index/stadtentwicklung.htm

Development Agencies

Austrian Business Agency (ABA)
www.aba.gv.at

Gate to Austria
www.gatetoaustria.at/

Burgenland
Wirtschaftsservice Burgenland AG (WIBAG): www.wibag.at
Kärnten

Kärntner Wirtschaftsförderungsfonds (KWF): www.kwf.at/

Niederösterreich
Niederösterreichs Regionale Entwicklungsagentur (ecoplus): www.ecoplus.at/

Oberösterreich
Oberösterreichische Technologie- und Marketinggesellschaft (TMG): www.tmg.at/

Salzburg
Salzburg Agentur: www.salzburgagentur.at/
Innovations- und Technologietransfer Gesellschaft: www.itg.at

Steiermark
Steirische Wirtschaftsförderungsgesellschaft (SFG): www.sfg.at/

Tirol
Tiroler Zukunftsstiftung (TZS): www.zukunfsstiftung.at

Vorarlberg
Wirtschaftsstandort Vorarlberg GmbH (WISTO): www.wisto.at/

Wien
Wiener Wirtschaftsförderungsfonds (WWFF): www.wwff.gv.at/
Zentrum für Innovation und Technologie (ZIT): www.zit.co.at