Innovating Regions in Europe

IRE Working Group

Effective Regional Innovation Systems

Final report

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CONTENTS

1. INTRODUCTION

This report is an attempt to summarise the findings, conclusions and recommendations presented during the activities undertaken by the IRE Working Group on Effective Regional Innovation Systems (ERIS).

ERIS was set up in autumn 2006 bringing together representatives from 15 IRE members regions: Bavaria, Castilla y León, Crete, East Sweden, Flanders, Helsinki, Lower Austria, the Province of Milan, the Province of North Brabant, Hungary's North Great Plain, Rhone-Alps, South East England, Southern Denmark, Wielkopolska, and Yorkshire and Humber.

The Working Group representatives work for organisations in charge of the promotion of the innovation capacity of their regions, such as regional governments and authorities, regional development agencies and regional innovation agencies.

The mission of the ERIS Working Group was to better understand how the effectiveness of regionalised innovation systems can be enhanced. The working methodology consisted primarily of the organisation of five meetings hosted by various member regions (i.e. Helsinki in November 2006; Vienna in March 2007; Ennis in May 2007; Heraklion in October 2007; and Eindhoven in February 2008), during which debates and presentations were delivered around specific topics. The outcomes of these meetings have profusely been disseminated on the IRE website.

The report offers a bird's-eye view on regional innovation systems concepts, structural elements, internal interactions, and barriers. Critical factors identified by the ERIS Group members that affect the success of the innovation systems are examined.

As regional innovation systems require good governance, trends and issues in regional governance in the innovation field are discussed, including governance principles, challenges, instruments and different approaches to innovation policy-making. Since regions are not alone in a globalised world, the issue of multilevel governance is addressed; reflection on how regions can influence or be influenced by higher and lower decision-making systems is provided.

Many aspects explored in the report are illustrated with regional practices implemented in the ERIS member regions which focus on rationales, innovative measures and outcomes.

Finally, a number of non-binding recommendations are offered providing regional decision-makers with a number of policy options based on available experience and knowledge at the ERIS participating regions.

2. REGIONAL INNOVATION SYSTEMS

The concept of regional innovation systems is relatively new at the level of policy though it has been discussed since the early 1990s. In the past decade, the literature on regional innovation systems has considerably enhanced the understanding of the critical role played by geographical proximity and local institutional conditions for the production of new knowledge and its economic exploitation.

Due to the combined effects of globalisation trends and the acceleration of technological change, continuous learning and innovation have become a key factor for sustainable competitiveness and growth in the regions. In the last few decades it has become evident that the regional level plays a major role for the generation of new knowledge and its exploitation. Regional innovation systems started being recognised as having an important role to play in economic and innovation policy as they highlight the crucial importance of spatial proximity and favourable institutional structures at the regional level for innovation activities[1].

In the past 15 years the innovation system approach has substantially enhanced the knowledge about the nature of the innovation process. By stressing the systemic character of knowledge production, it has progressively replaced traditional theories such as the linear innovation model.

Innovation in a given territory is now better understood as a complex process involving users, producers and various intermediary organisations learning from each other regarding demand and supply capabilities and exchanging both tacit and codified knowledge[2].

The innovation system approach highlights that innovation is an interactive process that requires intensive cooperation between firms and other organisations such as universities and other public research facilities, technology centres, educational establishments, financing institutions, industry associations and government agencies and bodies.

Regional innovation has therefore been associated with the idea of collective learning involving the creation and further development of common or shared knowledge among individuals and organisations that make up a productive system. It is understood as a mainly localised process, so regional differences of

[1] Trippl, Michaela (2006); “Cross-Border Regional Innovation Systems”, SRE - Institute for Regional Development and Environment, Vienna University of Economics and Business Administration, p. 1.
[2] Cooke, Philip (2001); “From Technopoles to Regional Innovation Systems: The Evolution of Localised Technology Development Policy”, Centre for Advanced Studies, University of Wales, Vol. XXIV:1.

innovative capabilities are commonly seen as the result of specific learning trajectories embedded in different institutional settings[3].

The innovation system approach has become so popular that by the turn of the new millennium, governments practically everywhere in the advanced economies were promoting regional innovation and cluster-building policies as ways of boosting regional economic development and competitiveness[4]. The system approach does not only exist as a framework for studying economic and innovative performance but it can also be used as a concrete tool for policy-makers to systemically enhance localised learning processes in order to guarantee regional innovativeness.

Thus, the analysis of a regional innovation system allows the identification of key actors and resources (e.g. infrastructures available, sources of knowledge and expertise, financing, etc), as well as the way economically relevant knowledge is created and disseminated within a given territory. There are a number of reasons that may explain the need for policy development towards regional innovation systems[5], including:

- the concept of a regional innovation system helps public authorities to focus on their industrial strengths and to develop strategies for the future based on those strengths;

- a systemic and integrated analysis of both the firm side (i.e. innovation needs) and the supply side (i.e. innovation support) contributes to the design of a coherent public innovation strategy;

- the concept of a system also helps to clarify what type of support is to be set up at which policy level (local/regional/national/transnational) and what the possibilities for inter-regional cooperation are.

2.1. CONCEPTS

Despite the widespread use of the innovation system approach in policy-making circles, it remains a fuzzy concept. Many authors argue that it is very difficult to use it in practice. In fact, we still don't know much about the implications of the adoption of the innovation system approach for public policy (what to do, when and how to do it). Another issue that is to be understood is how regions that have

[3] Isaksen, Arne (2001); "Building Regional Innovation Systems: Is Endogenous Industrial Development Possible in the Global Economy?", Agder University College *in* Canadian Journal of Regional Science, XXIV:1, p. 105.
[4] Cooke, Philip (2003); "Strategies for Regional Innovation Systems: Learning Transfer and Applications", UNIDO – United Nations Industrial Development Organisation, Vienna, 2003, p. 1.
[5] Cooke, idem, pp. 9-10.

adopted an innovation system approach are dealing with the questions of when and how to intervene[6].

On the other hand, the variety of regional innovation system types creates a significant degree of 'definition confusion', making it difficult for researchers and policy makers to envisage what a regional innovation system is, or should be. The innovation system approach thus suffers from the absence of a unified conceptual framework from which a universal model may emerge to guide research and policy[7].

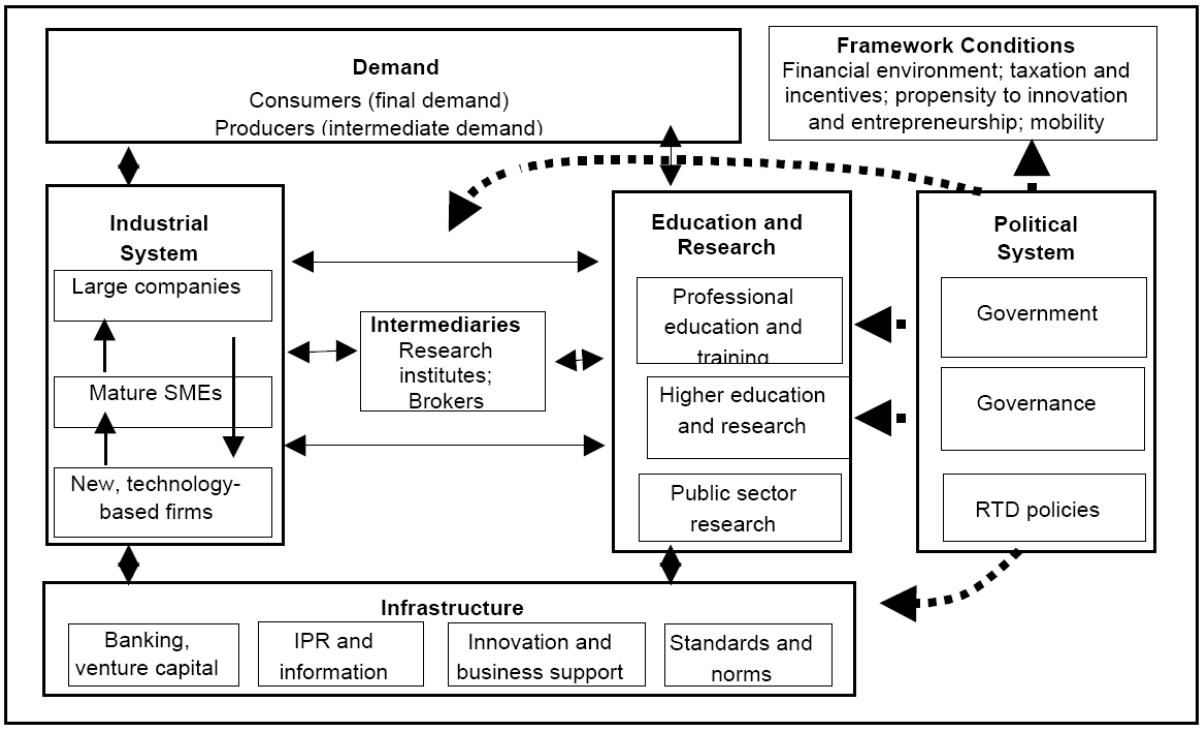
In the literature on innovation policy the meaning of the term 'system' has not been analysed in great detail. However, some general definitions of a system usually argue that this comprises a number of elements and the relationship between these elements. An innovation system would then be constituted by elements and relationships that interact in the production, diffusion and use of new and economically useful knowledge.

Taking these meanings into consideration, a regional innovation system can be defined as the set of economic, political and institutional relationships within a given geographical area that generates a collective learning process, leading to the rapid production, diffusion and use of knowledge.

The aim of an innovation system is to produce knowledge, spread information and to use it for economic development. The system is to support firms in their innovation needs in the context of increasing global competitiveness and rapid technological change. At the core of the system are different actors and their interactions. The system is built on different regional partners or players, such as research institutes, universities, technology transfer agencies, chambers of commerce, financing institutions, investors, government departments, individual firms as well as company networks and industry clusters.

A simple model for an innovation system could be presented in the following way[8]:

[6] Chaminade, Cristina and Edquist, Charles (2006); "Rationales for public policy intervention from a systems of innovation approach: the case of VINNOVA", CIRCLE Electronic Working Paper Series, Paper no. 2006/04, pp. 2-3.
[7] Doloreux, David and Parto, Saeed (2004); "Regional Innovation Systems: A Critical Systhesis", INTECH – Institute for New Technologies, United Nations University, Discussion Paper Series #2004-17, p. 29.
[8] Arnold, Erik and Kuhlman, Stefan (2001); "RCN in the Norwegian Research and Innovation System", Background Report Nº 12 in the Evaluation of the Research Council of Norway: Royal Norwegian Ministry for Education, Research and Church Affairs, Oslo, p. 2.



Source: E. Arnold / S.Kuhlmann.

A strong regional innovation system can therefore be seen as one with systemic linkages between different sources of knowledge production (universities, research institutions, and other intermediary organisations) and both large and small[9] firms.

The innovation system approach has been widely adopted to underline the importance of regions as modes of economic and technological organisation, and to reflect on the policies and measures aimed at increasing the innovative capacity of the regions. Nonetheless, the level of regional administration can differ quite a lot across various countries. Although the increasing importance of regional economies is widely acknowledged, there is still no general understanding of how to define a region.

Nevertheless, a number of criteria have commonly been used for this definition. Namely, the region[10]:

- must not have a determinate size;
- should be homogeneous in terms of specific criteria;
- can be distinguished from bordering areas by a particular kind of association of related features; and
- should possess some kind of internal cohesion.

[9] Cooke, op. cit., p. 10.
[10] Cooke, idem, p. 3.

Furthermore, the boundaries of regions are not fixed once and for all. Regions can change, new regions can emerge and old ones can perish. Therefore to analyse a region, criteria must be found that define a functioning unit within a specific time[11].

2.2. REGIONAL INNOVATION SYSTEMS, NETWORKS AND CLUSTERS

Distinguishing between the concepts of 'regional innovation system', 'regional innovation network' and 'regional cluster' is relevant when discussing policy implications.

Regional clusters are seen as mainly a spontaneous phenomenon; a geographic concentration of firms often developed through local entrepreneurial activity.

Regional innovation systems, on the other hand, are often seen as having a more planned and systemic character. Thus, the change from a cluster to an innovation system requires a strengthening of the regional institutional infrastructure, i.e. more knowledge organisations (both regional and national) are involved in innovation cooperation. In this way regional innovation systems may be a tool to create a supportive system of innovation on a regional scale.

The above-mentioned concepts could briefly be presented as follows[12]:

- Regional innovation system: cooperation between firms and different organisations (e.g. higher education institutions, R&D organisations, technology transfer entities, training organisations, business associations, financing institutions, etc) for economically useful knowledge development, diffusion and use.

- Regional innovation network: increasingly organised cooperation (agreements) between firms, stimulated by trust, norms and conventions.

- Regional cluster: a concentration of 'inter-dependent' firms within the same or adjacent industrial sectors in a small geographic area.

2.3. REGIONAL INNOVATION SYSTEM UNIQUENESS

The assets of the innovation systems remain specific as they cannot easily be imitated or made accessible to others.

[11] Cooke, op. cit., p. 3.
[12] Isaksen, op. cit., p. 104.

This reality points to the need to adapt innovation policy instruments in order to take into account the specific problems faced by a regional economy. There is no 'one-size-fits-all' policy instrument that suits all types of regions. From the systems perspective, innovation policy instruments must be adapted to the specific characteristics of individual regions which can be identified through analyses of regional innovation system barriers (i.e. factors that inhibit the regional industrial milieu, its institutional set-up, attitude towards innovation and entrepreneurship, etc).

According to this perspective the innovation performance of a regional economy depends on how firms utilise the experience and knowledge of other firms, research organisations, government sector agencies and other innovation support organisations in innovation processes. Innovation performance does not only depend on the capability of individual firms, although the know-how and attitude of entrepreneurs, managers and workers can be decisive. Firm level innovation is influenced by conditions in the firms' environment, and specific contextual factors may hamper as well as promote innovation processes[13].

In fact, this 'stickiness' of knowledge is due to the fact that some important types of knowledge are of an "informal, tacit nature constituted by skilled personal routines, technical practices, norms of behaviour, implicit and shared beliefs and co-operative relations in organisations, firm networks and local communities"[14]. This kind of knowledge cannot easily be isolated from its social and territorial context as it is a socially embedded knowledge which is difficult to codify and transfer through formal channels of information. Thus, whilst "information is relatively globally mobile, knowledge is remarkably spatially rooted"[15] (Cooke et al 2000).

2.4. REGIONAL INNOVATION SUBSYSTEMS

One of the assumptions of the innovation system approach is that many innovative firms operate in regional networks, cooperating and interacting not only with other firms such as suppliers and clients and competitors, but also with research and technology resource organisations, innovation support agencies, and regional government bodies. Innovation is a process that often benefits from the proximity of organisations that can stimulate it. Furthermore, regional authorities have an important role to play in supporting innovation processes by offering services and other mechanisms that boost the inter-linkages between all these actors.

Consequently, regional innovation systems involve cooperation in innovation activities between firms and knowledge creating and diffusing organisations

[13] Isaksen, op. cit, p. 108.
[14] Isaksen, idem, pp. 105-106.
[15] Isaksen, idem, p. 106.

which support regional innovation. This configures two subsystems of actors engaged in interactive learning[16]:

- The regional production structure or knowledge exploitation subsystem which consists mainly of firms, especially where these display clustering tendencies. This is the business dimension of the system, which can be characterised by the level of investment in innovation activities and their degree of linkage and communication in terms of networking, subcontracting, presence or absence of supply and value chains.

- The regional supportive infrastructure or knowledge generation and diffusion subsystem which consists of universities, training organisations, R&D institutes, business associations, financing institutions, technology centres, technology transfer organisations, etc. This is the infrastructure of enterprise innovation support. It can be characterised according to its networking propensity and key regional governance mechanisms.

For a functional regional innovation system, knowledge transfer is a crucial aspect in order for companies to improve their innovation, production and economic growth. Therefore, the link between enterprises and educational and research institutions is essential. Apart from this, the role played by the public sector and the various intermediaries is also of utmost importance[17]:

- Links between firms and Education and Research. Educational and research institutions can provide firms with expertise and RTD services that companies can apply in product, service and process development, for instance. Firms need to have information about the different services and cooperation opportunities provided by the educational and research institutions and should know how to seek support for their innovation activities from these institutions. On the other hand, research and educational institutions should be business-friendly and should offer and market their expertise and services to SMEs.

- Links between firms and the public sector. The public sector – authorities and other public organisations – influences the operational preconditions and environment within which firms operate through the implementation of different programmes and provision of financing.

- Links between firms and intermediaries. There may be many different kinds of intermediary organisations in a regional innovation system,

[16] Asheim, Bjørn T. and Coenen, Lars (2004); "The role of regional innovation systems in a globalising economy: comparing knowledge bases and institutional frameworks of Nordic clusters", Department of Social and Economic Geography, Lund University, p. 7.
[17] TeRIS project (2007); "Template for Regional Innovation System as a Tool for Evening out the Regional R&D Investment Disparities", Regions of Knowledge 2 – EC Sixth Framework Programme (FP6-2004-KNOW-REG-2), pp. 13-32.

including business associations, regional development agencies, science and technology parks, the R&D departments and technology transfer units of higher education institutions, etc. The intermediary organisations role is to identify concrete R&D needs of firms and to ensure that these needs are answered by services to businesses provided by different organisations.

2.5. REGIONAL INNOVATION SYSTEM BARRIERS

There are different types of barriers in regional innovation systems that may hamper innovation activity within the firm[18]:

Regional Innovation System problems	Type of problem	Typical problem region	Possible policy tools
Organisational 'thinness'	Lack of relevant local actors	Peripheral areas	Link firms to external recourses + acquisition
Fragmentation	Lack of regional cooperation and mutual trust	Some regional clusters	Develop regional 'club goods' and stimulate collaborative efforts
Lock-in	Regional industry specialised in outdated technologies	Old industrial regions and raw material based in peripheral areas	Open up networks towards external actors + local mobilisation

Source: Arne Isaksen, Agder University College.

In many areas a regional innovation system does not exist due to lack of relevant regional actors (i.e. organisational 'thinness'). An effective system requires a sufficient number of firms, as well as knowledge infrastructure capable of supporting collective learning. An example of this would be a region with sectors that have few technological complementarities and few important user-producer relations leading to a weak regional technological dynamic. A lack of collective learning may be a problem particularly in peripheral regions with small industrial milieus and which are located far from relevant knowledge organisations.

Policy directed towards stimulating regional innovation systems is probably misguided in most organisationally 'thin' regions[19]. A more adequate approach

[18] Isaksen, op. cit., p. 109.

may be to link regional firms to relevant national and international knowledge resources and firms, and to make efforts to attract innovative firms and highly skilled workers to the region and retain them there.

The situation in organisationally 'thin' regions also emphasises the fact that 'systems' should be understood both from a territorial and a functional perspective. From a functional perspective, firms draw on know-how and complementary assets from customers, suppliers, universities, funding and training organisations, independent of geographical location. Thus, firms may innovate successfully without belonging to a regional innovation system as long as they find relevant competences in national or international innovation systems.

In other areas, the relevant actors may be present without forming an effective regional innovation system (i.e. fragmentation)[20]. The region may have an industrial specialisation comprising many firms as well as relevant knowledge organisations but geographical proximity only creates a potential for interaction, without necessarily leading to dense local relations. The interactive practices of innovation often involve some form of communication and interpersonal linkages. However, in some regions interaction is hampered, leading to a fragmented system.

The first step to strengthening firms' innovation activity in 'fragmented' regions may be to improve relational assets that can lead to closer collaboration between regional actors. Empirical studies demonstrate that trust and cooperation between regional firms can be intentionally created through for instance the engagement of firms and knowledge organisations in the formulation of regional innovation strategies or the creation of nodes for local cooperation and collective organisation.

In the third kind of region described in the table above, regional innovation systems exist, but the systems are too closed and the networks too rigid, resulting in a 'lock in' situation[21]. This may arise if a region has historically had a strong regional innovation system based on R&D institutes and vocational training organisations with specialised activities dedicated to a declining technology. Such a regional production and innovation system, which has become technologically mature, must upgrade its knowledge base and promote product innovations in order to break path dependency.

In this kind of region it may be relevant to 'open up' strong regional networks and to fuel local mobilisation in order to prise local communities away from obsolete attitudes and knowledge, and to foster access to resources outside the region. Policy tools may also aim to reorient the region's technology support

[19] Isaksen, op. cit., p.109.
[20] Isaksen, idem, p. 110.
[21] Isaksen, idem.

infrastructure towards new technologies and sectors and to stimulate new firm creation as spin-off companies[22].

2.6. CRITICAL SUCCESS FACTORS FOR EFFECTIVE REGIONAL INNOVATION SYSTEMS

The members of the Working Group identified a number of critical success factors, which are necessary for a regional innovation system to be effective. These key elements are:

- interaction;
- openness;
- need orientation;
- steering;
- strategy;
- vision.

2.6.1. Success factor: Interaction

The level of interaction (e.g. intensity and regularity) established between the different players was found of crucial importance for an effective regionalised innovation system.

For a functional regional innovation system, the knowledge transfer is a fundamental aspect for companies to improve their innovation capacity. In particular the triple helix (i.e. University – Industry – Government) relations play an important role in stimulating knowledge-based economic development.

Regions that perform better in terms of creation and diffusion of knowledge are those that have evolved from rigid separate institutional spheres to a more flexible overlapping system, with each vertex of the triple helix taking the role of the other (e.g. the university can be a firm founder through incubator facilities; industry can be an educator or researcher through company universities or RTD activities; and the government can be a venture capitalist through the participation in venture funds). Bilateral relations between government and university, academia and industry and government and industry therefore have to be expanded into triadic relationships among the different spheres at the regional level.

Effective interaction also involves social networking, cultural diversity, business relationships and mutual trust. In particular, the functionality of a regional innovation system is essentially a matter of cooperation culture. If networks are

[22] Isaksen, op. cit., p.111.

not yet functional, it takes a long time to build them and to create trust among the different actors.

This leads to the need for the existence of social capital in the regions which depends upon the ability of people to associate with each other, and the extent to which their shared norms and values allow them to align their individual interests with the larger interests of the community. The presence of values that facilitate coordination and cooperation among individuals and organisations (particularly firms) are an actual asset for the local innovation systems.

It is important to enhance interactivity among the innovation system actors, which is achievable through a number of intentional actions such as:

- involvement of all central actors in the region related to innovation activities, such as regional authorities, higher education institutions, research organisations, business associations, financing institutions, and different intermediary organisations;

- clear definition of the roles of the various stakeholders, particularly those belonging to the innovation support subsystem (e.g. universities, R&D institutes, business associations, financing institutions, technology centres etc);

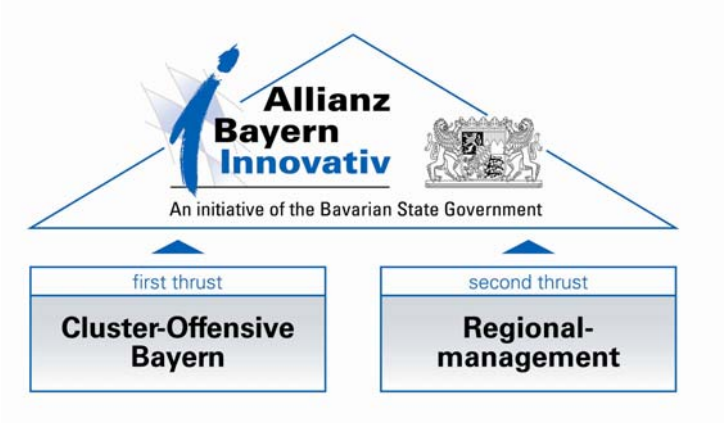
- shared, commonly agreed objectives among the regional system actors;

- fostering of working cooperation relations between the various regional actors through the creation of channels and processes for cooperation and information flow between the different stakeholders (e.g. networks, clusters, task-forces, events, publications, study visits, etc).

Different types of initiatives were identified among the participating regions in the Working Group to enhance the interaction within their innovation systems:

2.6.1.1. Enhancing interaction and networking in Bavaria – the "Allianz Bayern Innovativ" initiative

The cluster initiative "Allianz Bayern Innovativ", which was initiated in 2006 and is planned for a period of five years, was launched by the State Government of Bavaria to continue the already established policies for innovation and modernisation.



The objective of the initiative is to establish an active interaction fabric for the future of Bavaria in order to realise an optimal economic development by bringing together knowledge, people and investment capital in a structured way. The initiative is based on two pillars or thrusts: the “Cluster Offensive” Bavaria and the regional networking.

In 19 carefully selected technology and industrial areas, which are the most important for regional industry, “cluster structures” have been established through the “Cluster Offensive” initiative:

High-tech Clusters	Production-oriented Clusters	Cross-sectoral Technologies
Biotechnology Aerospace Satellite navigation Information and communications technology Environmental technology Medical technology	Automotive Chemicals Sensorics & power electronics Nutrition Forest and wood Financial services Media Energy technology Railway technology Logistics	Nanotechnology Mechatronics & Robotics Efficient production systems New materials

The key convincing factor was the idea that a region or sub-region will be increasingly stronger if strong enterprises, specialised suppliers and innovative research centres or university institutes are working together and are interacting in networks.

The main criteria for the selection of the cluster areas have been:

- already existing strong industrial structure;
- excellent trained and motivated workforce;
- outstanding scientific expertise in regional universities and research centres.

With the “Cluster Offensive” initiative the State Government will enforce the areas of excellence of the Bavarian economy.

The main activities of the cluster initiative are the formation, management and maintenance of interaction networks covering the region of Bavaria. Using a multitude of specific information sources, the established clusters offer targeted workshops and dedicated working groups, a neutral platform for the exchange of know-how and development of joint projects within the region’s industrial fabric or between industry and science. This is how innovative know-how will be developed into economic success.

The focal points of the cluster platforms are the strengthening of the region’s competitiveness and the production processes of the participants. All 19 clusters

are now in “full speed” and are increasing the networks, the communication platforms and the cooperation results. The Bavarian State Government allocated €50 million for the period of five years starting in 2006 for the implementation and operation of the cluster platforms.

2.6.1.2. Regional Innovation Pole of Crete

The Regional Innovation Pole of Crete (i4crete) is a union of organisations of the private and public sectors which aims at reinforcing the technological and innovative performances of Crete and the improvement of the competitiveness of the regional economy.

The Pole is funded by the initiative “Creation of Regional Innovation Poles” in the framework of the Hellenic Operational Programme “Competitiveness” (3rd Community Support Programme). The initiative supports the development of inter-connected clusters in Greek peripheral regions that demonstrate critical mass in certain sectors. i4crete is one of the first five regional innovation poles in Greece; the other four cover the regions of Thessaly, Central Macedonia, Western Macedonia and Western Greece.

The funding for the Regional Innovation Pole of Crete comes from the private sector (33%) and the Hellenic State (67%) which is the public money shared by the European Regional Development Fund (50%) and the Hellenic Ministry of Development (50%). The project started in late 2006 and will finish at the end of October 2008; continuation is foreseen during the programming period 2007-2013.

An innovation pole is made up of a combination of industries, research community and education institutions located within a well defined geographical area that create synergies around innovative projects in order to achieve critical mass. Every pole aims to create a “sectoral system of innovation” based on a small number of clusters or sectors and extended cooperation networks between R&D laboratories, businesses, and intermediary organisations. All in all, 44 regional actors are involved in the Regional Innovation Pole of Crete.

i4crete focuses its activities on the following scientific/ technological areas in which Crete has a comparative advantage due to the significant performances of the scientific community:

- Information Society;
- Biotechnology;
- Medical Technology.

The Innovation Pole of Crete is to achieve the following main objectives:

- Reinforcement of the research/technological activities implemented in the region in the areas which have a comparative advantage, sufficient infrastructures, skilful research staff and excellent technological achievements.

- Diffusion of the produced knowledge and innovation achieved in the foregoing technological areas to the enterprises and organisations of the public sector that operate in the region by focusing on a small number of economic activity sectors.

- Education and training of the human resources engaged in these specific sectors, as well as of the scientific staff to be induced in the production process by applying new technologies, new procedures and innovative systems.

Among other relevant outputs, the Innovation Pole of Crete is to boost the research infrastructure in six higher education and research institutions; create approximately 40 new products/ services, tools and methodologies which are exploitable in business terms; set up a technological platform for the diffusion of e-health broadband management technologies; establish a regional observatory for innovation, technology foresight and benchmarking; launch an incubator of ideas for university students; and develop applied research in thematic areas like broadband networks and infrastructures, e-business, e-health, ozone technology, wireless terrestrial and satellite technology, molecular identification of varieties of olive tree and vineyard, utilisation of biomass, telematics, etc.

2.6.2. Success factor: Openness

An open innovation system continuously interacts with its external environment (e.g. upper territorial level systems such as the national or transnational ones), so it can influence and be influenced by the elements outside the system. At the same time, an open regional innovation system receives input from a diverse range of regional stakeholders (users/producers/contributors of economically useful knowledge). Innovation systems can hardly ever be characterised as either completely open or completely closed, but are usually open to some influences and closed to others.

The openness characteristic in regional innovation systems is crucial not only to allow the generation of new ideas, products, services and processes in the region but also to facilitate the relations between the various actors that intervene in the system.

Some aspects that mark the openness tendency in a given region (e.g. individuals, organisations, networks) include:

- openness to change (i.e. ability to do something different);
- openness to other people, territories and new organisations;
- “get outside in” spirit (avoiding the “not invented here syndrome”);
- acceptance of cultural diversity;
- incentives for creation, experimentation and creative processes;
- propensity to internationalisation.

The concept of open innovation, which is closely related to this topic, has emerged in the last years. The central idea behind open innovation is that in a world of widely distributed knowledge, companies cannot afford to rely entirely on their own research, but should instead buy processes or inventions from other companies or organisations. In addition, internal inventions not being used in a firm's business should be taken outside the company (e.g. through licensing, joint ventures or spin-offs). The surrounding innovation environment no longer supports a logic of little or no use of external knowledge because the knowledge landscape has become too diverse and distributed for any company to monopolise useful ideas in a given technology/business area.

Regions can promote open innovation environments where competitive advantage often comes from leveraging the discoveries and intellectual property of others. More and more knowledge-intensive companies are looking to external sources of technologies and products to complement their internal R&D activity, which offers opportunities for new open innovation surroundings. As businesses all face the difficult task of launching and professionalizing new business development initiatives in a world that is becoming more open to joint innovation, regional authorities and intermediary organisations have an opportunity to put in place mechanisms to reinforce such cooperation (e.g. cluster-type initiatives and learning platforms), so as to allow companies and knowledge institutes using each other’s strengths, knowledge, experience and technology infrastructure to achieve more innovations and technology developments.

2.6.2.1. Open Innovation Environment at the High Tech Campus Eindhoven (North Brabant)

The High Tech Campus in Eindhoven has created an ecosystem that focuses on open innovation. Whereas R&D facilities and laboratories which were closed to the outside world and which had only hierarchical cooperation existed in the past, there is now a place where a network of companies and knowledge institutes work closely together and aim at using each other’s knowledge and technology infrastructure in order to achieve more effective technology developments.

The main initiator and investor in High Tech Campus Eindhoven was Philips Electronics, which founded the campus in 1999. A total investment of approximately €500 million has been made in buildings and infrastructure since then. A lot of facilities owned in the past by Philips are now in the hands of a

neutral brokerage company, which acts as landlord who takes care of the facility management and the letting of the buildings.

The High Tech Campus offers commercial spaces, conference areas, parking facilities, shops, restaurants, childcare facilities, and indoor as well as outdoor sports facilities. The campus hosts about 7,000 residents of about 50 nationalities.

It houses over 80 different R&D companies and technology institutes which may develop ground-breaking technologies and products together. The technology palette covered by these organisations is diverse but some core areas are emerging, i.e. technology areas that are well represented not only in the campus but also in technology businesses and knowledge institutes in the immediate surrounding areas. These technology areas are mainly micro/nano systems, life tech, infotainment, embedded software, and high-tech systems.

For start-up companies, a special building is reserved. The available types of buildings vary from office spaces for large parties (more than 300 people) to single rooms. The campus is completely WiFi connected.

At the High Tech Campus it is believed that open innovation is all about cooperation. With the current state of technology, a one-firm solution is seen as a thing of the past. The success rate of new initiatives that emerge from open innovation is substantially higher than the success rate of closed research centres. Open innovation also creates space for specialist companies to develop their core business at a high level and to market new products effectively.

2.6.3. Success factor: Need orientation

Firms can be considered as the actual customers of a regional innovation system. Consequently, their innovation support needs should be examined in a systematic way in order to promptly mobilise the right actions and resources towards appropriate measures.

As the knowledge and skills required by companies for innovating may evolve rapidly (due to scientific breakthroughs, technological change, market trends, new competition, etc), identifying the needs of firms must be regularly performed. The challenges faced by business must be understood by regional authorities and the various innovation support organisations and then translated into new or fine-tuned services.

Key elements to be considered in such a need-oriented and user-driven approach include:

- knowledge about the firm’s needs;
- client-orientation;

- proximity to the client.

The identification of such needs can be done using tools such as innovation demand surveys, market analyses, competitive intelligence actions, innovation gap analyses and foresight exercises, among others.

2.6.3.1. Identifying the needs of firms in Lower Austria's innovation system

In 1997, at the beginning of the development of the Regional Innovation Strategy of Lower Austria, the regional government carried out for the first time a large scale survey on the innovation support needs of firms. An impressive response from 600 firms paved the road for the development of the regional innovation strategy which was published at the beginning of 1999. Since then, the innovation strategy and the strong need orientation are the frame and drivers of the continuous improvement process of the regional innovation system.

The identification of needs is seen as an important success factor of the innovation system in Lower Austria as the effective innovation support requires clear customer orientation. Knowledge of the firms' current innovation competencies and the remaining gaps is the prerequisite for developing and delivering regional innovation support services. Instead of discussing the budget for single public organisations and competing with each other – as was too often the case in the past – the regional innovation support organisations are now primarily focussing in a systematic way on the regional firms as their customers by analysing the gathered information about the firms' needs, adopting appropriate measures to meet these needs, and comparing their current service portfolio with the required support. Every organisation is able to improve its own service portfolio and to find its position in the regional innovation system in consensus with the regional government and the other organisations.

In Lower Austria, identifying the needs of firms is not considered as a single-shot activity. The needs are not static, so their identification and analysis must be seen as an ongoing activity. These needs vary over time due to a number of reasons: existing gaps being closed; the development of firms and new global market trends which may create new needs; new R&D results and firms which may create new innovation support needs.

On the one hand, approximately every five years, the Lower Austrian government carries out a wide survey on firms' needs, on the usage of offered innovation services, and (more recently) on the impact of the services. In 2002/2003 a second large scale survey was carried out within the Regional Programme of Innovative Actions (RIS++ Lower Austria) with the participation of about 700 companies. In 2007, a pilot action involving 70 firms was carried out on firms' needs in comparison with their innovation profile and the impact of used innovation services (this survey was linked to the European innovation policy

assessment projects IMPACTSCAN and ARISE). On the other hand, the regional actors are today more sensitised to firms' needs and are paying increased attention to understanding the needs of their customers when having contact with them. Through the coaching activities implemented through "TIP – Technology and Innovation Partners"[23] the region is making companies increasingly open to innovation activities while at the same time identifying their needs in terms of innovation support.

It is also believed in the region that the identification of needs is not a stand-alone activity but one that should be strongly interlinked with implementation and monitoring actions. Paying ongoing attention to the firms' needs increases customer orientation and thus facilitates the conceptualisation and implementation of successful innovation support services. This customer orientation and insights based on qualitative (inter)regional comparison of needs for different innovation enablers or innovation services (firms' needs profiles) are important for the innovation system of Lower Austria. Matching the firms' needs and fostering their innovation activities is a *sine qua non* but not a sufficient condition for a successful innovation policy due to the way services are implemented, the provision of resources, the absorption capacity of the firms as beneficiaries of the services, etc. Thus, more and more, the regional government is interlinking the needs analyses with the monitoring and impact assessment of the innovation support measures in a qualitative as well as quantitative way in order to come up with clearer results of the impact of the regional innovation policy.

The large scale surveys have so far been regional initiatives co-financed by the European Commission within regional or transnational, inter-regional projects. This continuous gathering of needs as part of the day-to-day business of the actors and the monitoring of innovation services is essentially financed with regional money.

2.6.4. Success factor: Steering

Steering is necessary in order to fine tune the effectiveness of the innovation system through appropriate guidance and coordination of the activities undertaken by the various stakeholders. It provides answers on how to build, organise and coordinate the system in order to make it more effective. It is ultimately a matter of leadership and vision.

[23] TIP (Technology and Innovation Partners) is an initiative launched by the government and the Chamber of Commerce of Lower Austria to support and accompany innovation projects and set up contacts with research institutes and partners. The TIP project is aimed at SMEs and offers both the procurement of customised information relating to innovation and competent support for businesses throughout the innovation process - from experienced and specialised advisors acting as trouble-shooters and coaches. Specific advisory packages are available to support SMEs in the implementation of their individual innovation projects.

While functional regional innovation systems require capable steering, it does not seem possible for a single person or organisation to assume such a role alone. The steering of a regional innovation system is inevitably shared, and requires the combination of different skills and the involvement of a number of organisations which usually do not have command over each other. Very often these organisations have their own motives for participating in the improvement of the system and view its development from their own perspective.

Steering innovation systems is being increasingly associated with interactive processes involving various forms of partnerships and collaboration used to improve the system and assess its performance. Steering is therefore exercised not according to the traditional hierarchical process by a public authority, but rather through open forms of collaboration between a plurality of public and non public actors.

Among other responsibilities, the steering function is to secure the following aspects concerning the running of an innovation system:

- engagement of different actors and clarification of their roles in the system;
- enhancement of interaction between the regional institutions and networks and promotion of trust among all of them;
- implementation of tools and organisational structures to maintain a continuous flow of information and knowledge.

Many regions have set up steering platforms – steering committees, coordinating bodies, innovation forums – which bring regional authorities and the most prominent public and private regional actors closer together in order to supervise the implementation of the regional innovation strategies and to enhance the provision of innovation support activities. These empowered bodies have had increased political backing and the power to get their decisions implemented.

Relevant elements taken into account by the members of the Working Group as regards steering comprise:

- Clearly articulated strategy communicated to the whole region: strategic objectives which are defined following a suitable analysis and consultative process and which should be formulated in a consistent way to universities and R&D centres, intermediary institutions, business associations and other relevant innovation actors.

- Leadership: the involvement of regional and local innovation leaders (public and private, institutions and individuals), the promotion of strong innovation awareness, and the ability to mobilise local/regional groups for innovation activities.

- Stability in planning: long-term objectives and core directions should remain unchanged unless the circumstances change radically. Stability builds trust and stimulates involvement of regional innovation players.

- Methodology for measuring a “start point” and subsequent impact: monitoring and benchmarking effectiveness of regional RTDI policy; assessing the impact of innovation strategy in the economic performance of the region.

2.6.4.1. Steering “Flanders in Action”

As the Lisbon Agenda can be considered the European roadmap towards a competitive knowledge-based society, “Flanders in Action” can be seen as the equivalent initiative on the Flemish scale.

The main ambition of this plan, whose implementation started in 2006, is to make Flanders one of the top competitive regions in Europe by 2020. To achieve this objective, four action lines are being developed:
- to enhance the innovation and creative capacity of all actors of the Flemish region;
- to attract and stimulate talent;
- to boost Flanders’ position as the logistic hub in Europe;
- to make the government and the governance more efficient and effective.

“Flanders in Action” follows the Plan – Do – Check – Act model. Its budget will grow every year until 2020 with money dedicated by the Flemish Government to the fields of economy, research and innovation.

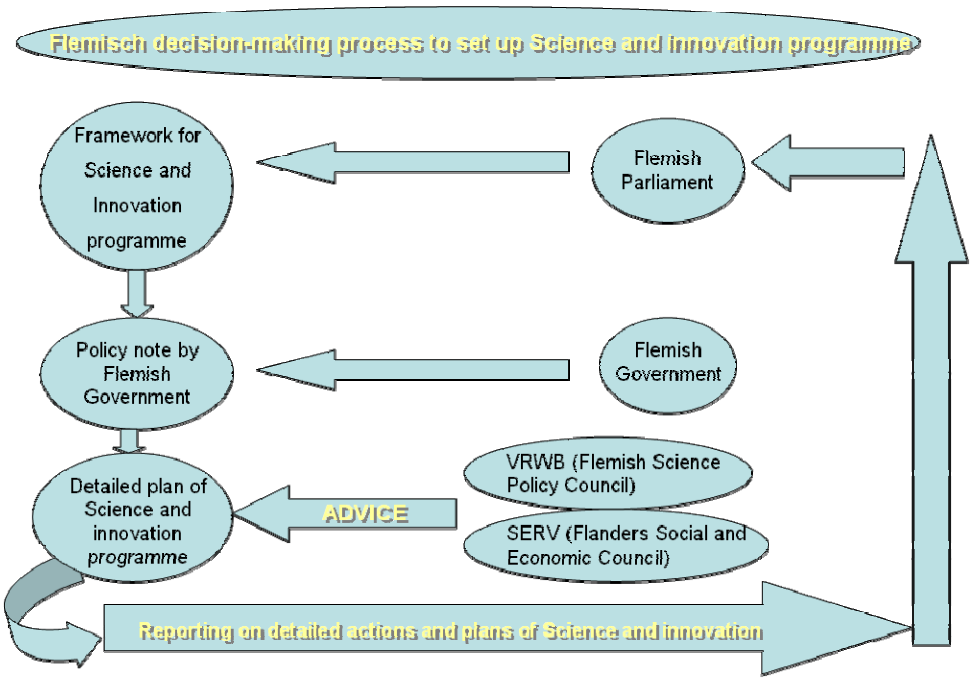
Regarding particularly the field of innovation, Flanders is first of all an important region in terms of scientific output. The region is well endowed with internationally renowned research centres (e.g. IMEC – micro-electronics, IBBT – broadband technologies; VIB – biotech and life sciences; VITO – energy and environment). The objective is now to create more research centres of identical dimension by 2020. The Science and Innovation Council of Flanders, where all the important stakeholders are represented, have already indicated which the important fields for Flanders’ future are:
- logistics, supply chain management;
- ICT and services for e-health;
- medicine: diagnostics and therapeutics;
- new materials for the industry;
- ICT in the services sector;
- energy and environmental services.

By 2020 there should be flexible and international career paths for knowledge workers. Their mobility between all components of the Triple Helix needs to be

enforced. This breakthrough can find inspiration in the concept of “flexicurity“, where flexibility in the career course will be coupled with the necessary social security rights. Also a lot of attention is to be given to the development and stimulation of entrepreneurship and its implications towards the educational system. Innovative learning conditions and programmes are to be developed.

Another important aspect to be addressed by the action plan is the instruments for innovation stimulation, which need to enhance the innovation capabilities of SMEs. So far these innovation instruments are less oriented towards SMEs for whom innovation in marketing, business model, and service delivery is far more important than product or process innovation. This means that the scope of the government’s innovation instruments has to be broadened.

The outcome of the plan will be followed up, monitored and measured. In this respect, methodologies and tools developed by the IMPACTSCAN project[24] will be taken into account. Currently, governance as regards the innovation field in Flanders could be presented as follows:



[24]IMPACTSCAN is a project co-funded by the European Commission (6FP, IMPACTSCAN4INNOPOL 2005-2008) that provides a monitoring and impact assessment system, allowing regional authorities to get a clearer picture of public support to innovation in their territories.

However, to implement “Flanders in Action”, the governance of the innovation system will undergo some adjustments. First of all, the Department of Economy, Science and Innovation of Flanders’ Government will help the Flemish Minister of Economy, Enterprise, Science, Innovation and Foreign Trade with policy preparation and evaluation. An independent board of experts will advise the Minister on strategic issues.

Then as R&D, innovation, entrepreneurship and internationalisation are key aspects for Flanders in the new era of the knowledge economy, in the future there will be four main agencies that will execute the innovation policy:

- the Fund of Scientific Research (oriented towards the Higher Education Institutions);
- the Innovation Agency (IWT);
- the Agency for Entrepreneurship;
- the Agency for Internationalisation (FIT).

2.6.4.2. The Innovation Forum in the Province of Milan

Italy is administratively structured in Regions, Provinces and Municipalities. The Provinces are autonomous bodies which have administrative functions in several areas such as environmental protection; roads and transport; secondary education and professional training; and economy and employment.

The Province of Milan acts as the local government body for the Milan Metropolitan Area. In the field of innovation, the Province has in the last years developed strategic actions in fields like the establishment of a regional innovation system, promotion of technology transfer activities, and support to the creation and growth of new, innovative companies.

The model adopted by the Province to carry out its actions in the above mentioned fields, include the reinforcement of cooperation between institutions (official collaboration agreements), the creation of both horizontal and vertical relationships and networks (from the European Union to the National Government, to the Lombardy Region, down to the municipalities), the cooperation of public/private sectors (trade unions, entrepreneurial associations, companies), and an integrated and multi-sectoral policy approach (e.g. policies supporting the labour market, policies promoting innovation, policies facilitating the services targeted to enterprises and training policies, policies for territorial re-qualification and promotion, etc).

In order to better coordinate the local innovation system and outline the strategic framework programmes to support economic development and innovation (i.e. 1999-2001, 2002-2004, 2005-2007), the Province of Milan launched the Innovation Forum (''Forum per l'innovazione''). More specifically, the Forum is to promote the discussion concerning technological scenarios and local innovation

policies; design innovation action plans; monitor and assess actions and policies carried out in the Milanese area related to innovation; and promote the exchange of information among the relevant regional players.

About 60 members take part in the Innovation Forum. Besides the Province of Milan and the Lombardy Region, the Innovation Forum has involved representatives of the main organisations of the local innovation system, such as business associations, business centres, technology transfer centres, business incubators, research centres, development agencies, universities, and financial institutions, among others. The presidency of the Innovation Forum is held by the Minister ("Councillor") for Labour and Economic Activities of the Province of Milan.

The Forum activities are supported by a specific office that acts as its operational body. The office is responsible for implementing activities such as organisation of meetings, communication and marketing, running of working groups, organisation of seminars and conferences, etc.

The Forum meets twice a year and is chaired by the Economic Activities and Innovation Department of the Province. The main activities are carried out through plenary meetings and thematic working groups. The policy decision-making process usually follows the following path: **1)** the Innovation Forum suggests policies and actions; **2)** the Economic Activities and Innovation Department draws up a strategic plan; **3)** the Provincial Council and the Executive Committee approve the strategic plan.

2.6.5. Success factor: Strategy

An innovation strategy is a long-term plan of action designed to enhance the innovation capabilities of the region. It is imperative that a region has a clear innovation strategy which has been developed with the involvement of the whole community. The strategy should encourage harmonised interaction between the public and private sectors.

Over 150 European regions have developed Regional Innovation Strategy (RIS/RITTS) projects with support from the European Commission. The regions that developed RIS and RITTS models have been brought together under the Innovating Regions in Europe network, which provides a platform for the transfer of knowledge and experience in regional innovation policy making.

The regional innovation strategies developed under the RIS/RITTS model follow five main steps:

- initiating regional dialogue;
- direct involvement of all relevant organisations in shaping innovation policy;

- analysis of regional innovation needs and capacities;
- selection of priorities for innovation support;
- development of action plans and pilot projects.

This model has provided IRE member regions with a unique, tried-and-tested approach to the promotion of innovation and has allowed regions to align innovation support with the real needs of companies.

Important aspects to be addressed by an innovation strategy may include among others:

- mechanisms for better coordination of the innovation system;
- monitoring and assessment of the innovation system;
- strengthening of triple-helix relations;
- promotion of R&D activities;
- technology/knowledge transfer actions;
- development of clusters, supply chains and company networks;
- supply of economic intelligence/technology watch services;
- internationalisation and foreign investment (particularly knowledge-intensive, technology-based ventures);
- support to high-tech, high-growth entrepreneurship;
- promotion of an innovation culture and entrepreneurial mindset;
- provision of innovation financing;
- boosting innovation in the public sector;
- promoting innovation in SMEs;
- new legislation favouring innovation;
- provision of enhanced innovation support services and infrastructure;
- marketing the regional innovation profile;
- workforce skills development.

A fundamental aspect of a successful strategy is communication and dissemination, so as to give visibility to the strategy, diffuse progressively the outcomes, and motivate the regional innovation actors to take part in it. In this respect, specific policy/strategy papers may be of particular use.

The Working Group members identified other key critical aspects for a strategy to be implemented successfully:

- existence of political backing and consensus among the regional actors;

- involvement of regional champions and the various stakeholders sharing with them specific roles with clear division of responsibilities;

- existence of an innovation and entrepreneurial culture in the region;

- clear identification and communication of priorities avoiding fragmentation;

- existence of infrastructure-supporting innovation (technological, incubation, financing, expertise);

- existence of critical density of innovation collaborations (clusters, networks, supply/value chains) and of regional knowledge excellence;

- clear objectives and milestones to evaluate the progress of the implemented measures;

- strong and legitimate leadership;

- maintenance of adequate resources and tools for implementing the strategy and monitoring its implementation.

2.6.5.1. Building a regional innovation strategy in the Helsinki Metropolitan Area

The idea of a common innovation strategy for the Helsinki Metropolitan Area emerged in spring 2003 from the second Helsinki Club of leading policymakers convened by the Helsinki mayor. The Club envisaged an innovation strategy for the Helsinki Region in order to reinforce collaboration between various participants in the region. Educational and research organisations, the cities of the region, national innovation organisations and local enterprises played a key role in this collaboration.

The process of formulating the innovation strategy was financed by the Finnish Funding Agency for Technology and Innovation – Tekes and by the local authorities of Helsinki, Espoo and Vantaa. It was implemented by the Uusimaa Development Company Culminatum Ltd, which took the formal decision to launch the project in August 2003 and hired a full-time project director at the beginning of 2004. Culminatum then invited a steering group to guide the project. This steering group comprised the Board of Directors of Culminatum, together with five outside experts from different bodies: Finnish National Fund for Research and Development – SITRA, Nokia Plc, Uusimaa Employment and Economic Development Centre, University of Helsinki and Tekes.

The steering group decided to initiate the work on two levels: **1)** overall management, and **2)** interventions in important subject areas. Teams were set up for six special subject areas involving the work of more than 100 experts in all. It is unlikely that the work of formulating the strategy would have created significant results without the expertise and considerable investment of time by these innovation professionals. Experienced chairmen were invited to lead the six special subject teams: **1)** the role of the cities, **2)** development platforms, **3)** seed financing, **4)** creative sectors, **5)** the technology centre concept, and **6)** Helsinki

Region as an international setting for education and research. A strategy seminar organised in summer 2004 attracted more than 170 specialists to a debate on the principles of an innovation strategy. A grand total of more than 300 innovation participants were involved in various aspects of formulating the strategy.

An initial discussion paper on the innovation strategy was commissioned in 2003 under the title 'Development of Helsinki Region as an innovation environment'. The Centre for Knowledge and Innovation Research at Helsinki School of Economics and Business Administration interviewed more than 100 influential people in the Helsinki Region to investigate the principal bottlenecks and future prospects of innovation activity.

There are many equally relevant or irrelevant approaches for building a regional innovation strategy depending on local circumstances and prerequisites. The key issues during this process were to accept the limits of a joint strategy, ability to make selections and to get all key parties committed.

There were four pillars in the strategy development: **1)** Improving the International Appeal of Research and Expertise, **2)** Reinforcing Expertise Clusters and Creating Common Development Platforms, **3)** Reform and Innovations in Public Services and **4)** Support for Innovative Activity.

In spring 2007, Culminatum Ltd evaluated how the measures and recommendations started within the Helsinki Metropolitan Area Innovation Strategy were proceeding. The strategy process was found to have been very challenging including many actors and organisations and comprising many recommendations and projects. Involving the different organisations and actors in the process has been challenging.

Some activities have been somewhat separate from each other and have stayed rather fragmented. In addition, the interaction between the four pillars was considered inadequate. Sometimes there was also unclear division of responsibilities between different parties. Also there seemed to be inadequate tools and resources for monitoring the implementation.

Drafting the new strategy “The Competitiveness Strategy for the Helsinki Metropolitan Area” was started during 2008. During the new strategy process, better monitoring and assessment principles and indicators are also planned to be developed**.**

2.6.5.2. Forum for Growth in Southern Denmark

Appointed in April 2006, the Forum for Growth is composed of 20 members representing the different regional stakeholders of Southern Denmark (e.g. regional authority, local authorities, business sector, educational institutions,

employers' and employees' organisations, etc). Its annual budget amounts to approximately €12 million.

The Forum for Growth strategy provides the direction of the region for the next five years as regards business development and growth in six main areas: **1)** cluster development; **2)** entrepreneurship; **3)** research, innovation and new technologies; **4)** health and quality of life; **5)** tourism and experience economy; and **6)** human resources. Innovation is considered to be a central but integrated part of the business development system and is seen as closely related to other relevant areas.

A major challenge for the Regional Forum for Growth is to reach an agreement between the members on what the most important initiatives to be undertaken are. Traditionally, the agendas and the focus of these stakeholders have considerably varied. For the Forum strategy to have an impact, it is important that it is both clearly communicated and carried out via the initiatives co-financed by the Forum and promoted by the various stakeholders in their own line of work. The idea of the Forum becoming a partnership formed by the various regional stakeholders is being stressed to ensure that it is not regarded as an instrument of or dominated by the stakeholders.

Due to the partnership concept and the many stakeholders involved there is the risk that the initiatives agreed upon have less regional impact. Or that once initiated they do not receive sufficient support, financial or other, to be successful. Ideally there is no particular leadership with regards to the innovation system but instead a strong common driving force with changing leadership, public or private, depending on the issue. In the Region of Southern Denmark it is not unusual that local groups of business people initiate processes and projects, especially regarding cluster development.

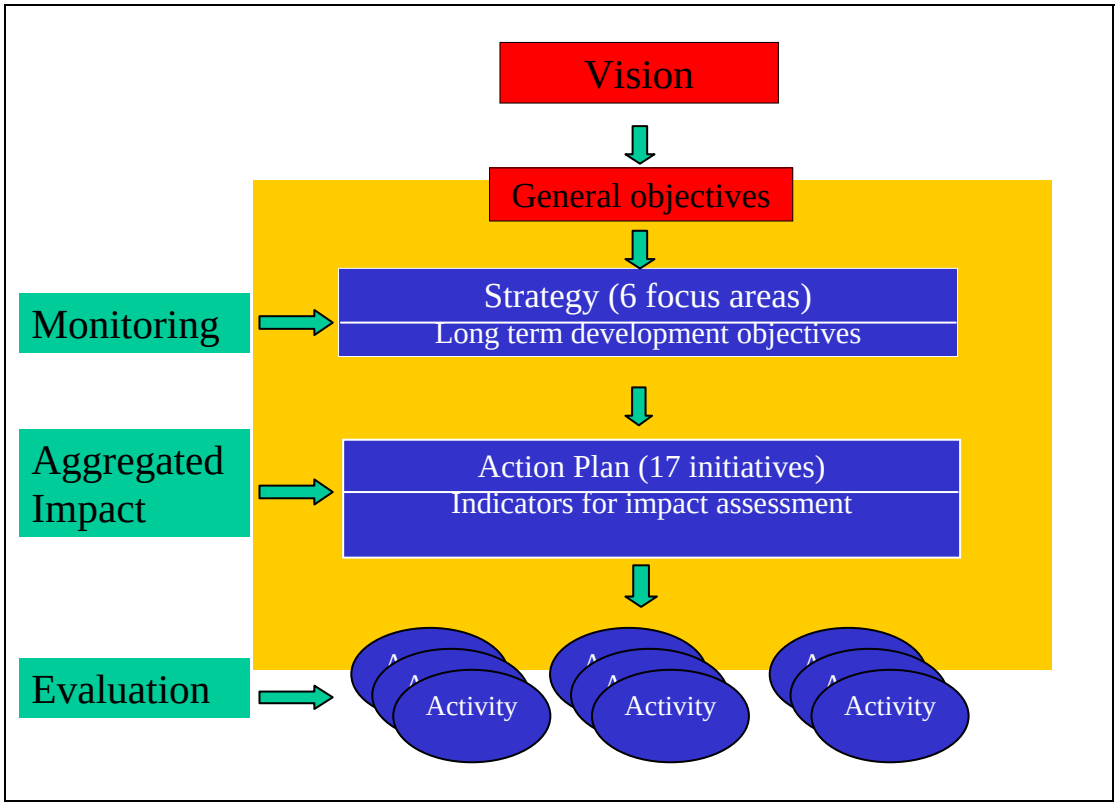
In order to achieve long-term stability, the strategy of the Regional Forum for Growth must connect the strategies made at local level with regional and national level strategies and programmes. Presently negotiations are being carried out to form a partnership agreement between the Danish Government and the Regional Forum for Growth on how the two parties can define common goals and mutually assist each other in carrying out strategies for development and growth. Through this agreement the National Government is committed to using relevant national programmes to support the regional strategy and, whenever possible, regional funds will be coupled with national funding and regional initiatives will be coupled with funding from the European Regional Structural Fund.

Special attention is being paid to monitoring the strategy implementation and the evaluation of its effects. The impact of the initiatives will determine future revisions (initiatives or even the strategy in the long term) and will help decide the future levels of funding.

The Forum for Growth strategy is structured around the following main levels:

- a general level comprising a vision statement;
- a second level encompassing a few general objectives, i.e. sentences on the main directions the region wants to take (e.g. Education, Entrepreneurship);
- a third level consisting of six focus areas which contain long-term development objectives;
- a fourth level composed of an action plan that includes 17 initiatives stemming from the six focus areas.
- a fifth level formed by evaluation actions, namely aggregation of data clarifying the effects of the initiatives implemented.

The different levels are indicated below:



2.6.6. Success factor: Vision

A vision defines where a region wants to be in the future, and is often stated in competitive terms. It is an optimistic view of the future that sometimes regions

summarise into a ‘vision statement’, which outlines what the region wants to become.

The vision statement can galvanise local stakeholders to achieve defined objectives. It should stimulate all concerned regional players and help them feel motivated and part of a bigger whole. A vision should stretch the region’s capabilities and image of itself, and should give direction to the region’s future.

Vision statements may range in length from a couple of words to a few pages. As people tend to remember short vision statements more easily, it may be advantageous if the regional vision is a short, succinct, and inspiring statement of what the region intends to achieve at some point in the future. The statement describes aspirations for the future, without necessarily specifying the means that will be used to achieve these desired aims.

An effective vision statement may include:

- clarity and lack of ambiguity;
- an indication of future direction;
- memorable and engaging expression;
- achievable, realistic aspirations;
- alignment with regional values and culture;
- time references regarding the achievement of any objective.

A number of steps should be taken when establishing a vision for a given territory:

- **Answer questions** such as: What does the region want to achieve? What does the region want to become? What are the benefits and their importance?

- **Take action**: Talk, listen, gather input from others in order to shape these aspirations into a coherent vision.

- **Help concerned actors** see the importance of their role in turning this vision into reality. To be successful the vision must be shared and supported.

- **Connect the vision to a strategy**: Questions like "what", "how", "when", "where" and "by whom" are to be answered.

- **Involve institutions and people** as far as possible and encourage them to make their valued and unique contributions. Visions can't be micro-managed.

- **Communicate your visions**: A strong and consistent message will help institutions and people to stay connected and believe in the importance of the vision.

To become really effective, a regional vision statement must become assimilated into the region's culture. Leaders have the responsibility of communicating the vision regularly, creating narratives that illustrate the vision, acting as role-models by embodying the vision, creating short-term objectives compatible with the vision, and encouraging others to draft their own personal vision which is compatible with the region's overall vision.

The Working Group members considered the aspects below as critical when defining a regional vision:

- long-term focused (beyond elections and political cycles);
- focused on regional strengths;
- realistic and motivating;
- fully communicated;
- consistently followed and measured.

3. REGIONAL INNOVATION GOVERNANCE

Effective regional innovation systems require "good governance". Governance concerns the practices that regions use to set priorities, implement policies and obtain knowledge about their impacts and effectiveness. It has increasingly been understood as an interactive process involving various forms of partnership, collaboration, competition and negotiation.

Governance can be applied at all stages of the policy cycle, i.e. policy preparation, shaping, execution, control and follow-up. It thus includes the broader reorganisation of roles and responsibilities aiming at increasing the opportunity for a number of new actors to participate in the formulation, implementation and enforcement of innovation policy[25].

The expression governance is principally used with respect to decision making systems, where the decisions are not taken according to the traditional hierarchical process by a public authority ("government"), but rather through open forms of collaboration between a plurality of public and non public actors. Decisions taken may differ between the various specific areas of policy and between the various levels of government. Governance has become the challenge of steering and it is ultimately a matter of leadership, responsibility and vision[26].

Governance capabilities can be defined as the ability to recognise system characteristics (strengths, weaknesses, problems, development potential); to define the focus and the topics for political action (agenda setting); to help diverse players coordinate their activities in and beyond their policy field (horizontalisation); to implement these policies; to learn from previous experience (e.g. from evaluation results); and to make adjustments over the complete policy cycle.

Stoker (1998) offers five propositions related to governance[27]:

- It refers to a set of institutions and actors that are drawn from within but also from outside government.

- It identifies the blurring of boundaries and responsibilities for tackling social and economic issues.

[25] European Commission (2001); "Decentralisation - Better involvement of national, regional and local actors"; Report by Working Group 3b of the White Paper on European Governance, p. 4.
[26] Cappellin, Riccardo (2007); "Regional Governance in the Knowledge Economy: policy strategies and policy-making models", University of Rome "Tor Vergata" in the 47th Joint Congress of the European Regional Science Association, p. 20.
[27] OECD – Organisation for Economic Co-operation and Development (2005); "Governance of innovation systems" in Volume 1: Synthesis Report – OECD Publishing, pp. 23-24.

- It identifies the power dependency involved in relationships between institutions involved in collective action.

- It is about autonomous self-governing networks of actors.

- It recognises a capacity to get things done that does not rest on the power of government to command or use its authority. It sees government as able to use new tools and techniques to steer and guide.

Modern knowledge-based economies call for innovation policy tools that foster the visionary, leadership, networking and learning activities in the process of designing and implementing innovation policies and strategies.

It is important to underline the difference between the traditional "government" model based on economic planning, state intervention, and public owned firms and the "governance" model based on negotiation, coordination mechanisms and intermediate institutions.

In a network model, the policymaker can not adopt typical hierarchical methods, such as traditional planning ("government"), but should be capable of guiding or steering the network of the various economic, social and institutional actors ("governance"), in order to orient the relationships between the latter, for promoting self-sustained economic development processes[28]. The governance approach is characterized by the gradual search for a consensus between different stakeholders on the selected issues to be decided. This inevitably leads to more complex solutions than those indicated by top down decisions or by the belief in the "rational" results of market competition.

It is now widely recognised that the interventionist top-down model ("government") in the innovation policies is neither possible nor desirable, since innovation by its very nature can not be reduced to command; it has a proactive character and it is open to new discoveries. Innovation depends essentially on the autonomy and active collaboration of researchers and entrepreneurs, rather than on passive obedience. Incentives and negotiations, rather than orders seem to be the main instruments for promoting and managing innovation.

Ensuring public participation in the policy-shaping phase can help achieve better and more effective policies, while at the same time increasing acceptance and support for the decisions proposed or taken. Much of recent thinking on processes of regional development stresses the role of knowledge as a development factor, often giving it an overwhelming importance relative to more traditional factors such as labour and capital. In such discourses, universities and other knowledge infrastructures also occupy a key role both as resource

[28] Cappellin, op. cit., p. 14.

endowments within the region, but also more interestingly as active participants in the construction of regional competitive advantage. Regional economic success will depend on the ability to create and apply knowledge that is specific to the firms in that region – in other words it is tacit or difficult to transfer, or is new information and can be used locally before being taken up by firms in other locations.

The core of the idea of regional governance is that the "government" no longer monopolizes policymaking but instead engages in collective decision-making with other levels of government and relevant actors, and in so doing, cedes control of the policymaking process. Decision-making competencies are therefore shared among all actors with no one level exercising monopoly over another.

In this way governance can respond effectively to the demands of the knowledge-based economy. It promotes a collective process of interactive learning among firms, associations, and public agencies that is essential to innovation in the modern knowledge-based economy. As a result, successful regions must be able to identify and cultivate their assets, engage in collaborative processes to plan and implement change, and encourage a regional mindset that fosters growth. These circumstances put new pressures on processes of regional planning.

3.1. THE CHALLENGE OF COORDINATION

Not every community succeeds in rising to the challenges outlined above. Often communities suffer from a deficit of social capital, an inability to generate sufficient trust or cooperation among key players to generate the supportive institutional arrangements required to promote growth[29]. This may result in a 'governance' failure, which arises from the inability to bring key players together to develop new institutions and the required supports.

It may also result from a lack of policy coordination, especially from the levels of government, who frequently are not aware of the actions and initiatives being pursued by the others at regional and local level. Governance relationships however can only enhance regional innovation potentials if the learning capability and absorptive capacity of the regional policy and promotional institutions, as well as the political networks existing between them are sufficiently developed.

[29] Wolfe, David A. and Creutzberg, Tijs (2003); "Community Participation and Multilevel Governance in Economic Development Policy", Regional Innovation Systems Centre for International Studies, University of Toronto, p. 38.

As governments attempt to respond to greater external and internal complexity and dynamism, policy coordination becomes the main means of achieving greater coherence. Difficulties in achieving this goal include the following[30]:

- Coordination mechanisms may be static and short-term rather dynamic, particularly when there is significant institutional fragmentation and short-term considerations dominate agenda setting. Coordination may simply concern annual budget-related decisions and be decentralised to implementing institutions. This does not lead to long-term or strategic policy priorities.

- Designing coordination mechanisms takes time and financial support. A sense of urgency is necessary if efforts to coordinate policy are to affect policy governance. Without a sense of urgency, coordinating arrangements may fail and the system may build up resistance against subsequent attempts.

- Coordination across policy domains: People are more decisive than structures but structures support people. Well-functioning co-ordinating activities require personal leadership and commitment, and policy makers should ensure supportive structures for co-ordination activities that rely on persons.

- Because different mechanisms are typically needed at different regional levels, arrangements that function well at ministerial level may be less relevant for lower levels. The need for different mechanisms for different types of policy issues seems to substantiate this. Moreover, successful coordination on one level sometimes reduces the need for investing in coordination on another.

- As for the regional innovation system, it is necessary to identify strong and weak links. With appropriate analysis of coordination failures, targeted coordination arrangements may be easier to design and implement.

Due to organisational or institutional inflexibility, it is often easier to create new governance structures than to try to adapt existing ones. The shift from institutional to more network and programmatic types of initiatives leads to more complex governance structures, as these help to weave an increasingly complex web of new and old players in the innovation system. Well-managed older players make sure to join and they even partly shape the new initiatives so as to avoid being abolished.

[30] OECD, op. cit., pp. 60-61.

3.2. 'GOOD GOVERNANCE' PRINCIPLES

Despite its accomplishments, the literature on governance displays an unresolved problem that is crucial for our understanding of governance: the tension between *functionality* on the one hand, and *democracy* and *politics* on the other.

Five principles underpin good governance[31]: *openness, participation, accountability, effectiveness and coherence*. Each principle is important for establishing more democratic governance. They underpin democracy and the rule of law in the Member States, but they apply to all levels of government – global, European, national, regional and local.

Cooperation is therefore needed as the working method for promoting links between the various actors and establishing governance. The political preconditions are: political will, information, the capacity and hence appropriate training of regional and local administrations, and culture. It is therefore necessary to organise a permanent, and not just occasional, debate.

3.3. GOVERNANCE AND DIFFERENT FORMS OF REGIONAL INNOVATION SYSTEMS

Following Cooke et al. (2004), the governance dimension can generate three different regional innovation system forms: grassroots, network and *dirigiste*.[32]

Grassroots is where the innovation system is generated and organised locally, at town or district level. Financial support and research competences are diffused locally, with a very low amount of supra-local or national coordination. Local development agencies and local institutional actors play a predominant role.

A network regional innovation system is more likely to occur when the institutional support encompasses local, regional, federal and supranational levels, and funding is often guided by agreements among banks, government agencies and firms. The research competence is likely to be mixed, with both pure and applied, blue-skies (exploration) and near-market (exploitation) activities geared to the needs of large and small firms.

A *dirigiste* system is animated mainly from outside and above the region itself. Innovation often occurs as a product of central government policies. Funding is centrally determined, with decentralised units located in the region and with

[31] European Commission (2001); "European Governance: A White Paper", p. 10.

[32] Cooke, Phillip (2006); "Regional Innovation Systems as Public Goods", UNIDO – United Nations Industrial Development Organisation, Vienna, pp. 8-11.

research competences often linked to the needs of larger, state-owned firms in or beyond the region.

3.4. DIFFERENT APPROACHES TO INNOVATION POLICY-MAKING

The debate in Europe on innovation policies allows the identification of various alternative approaches in public policy-making:

- the centralist model of planning ("government");
- the free market model;
- the public-private partnership model of governance.

Policy-making approaches and instruments of innovation policies could be presented as follows[33]:

A) Government model:

- public owned industries;
- subsidies to strategic private industries;
- national agencies of sectoral industrial plans;
- public funding of R&D;
- regional offices of national agencies or departments;
- public demand and fiscal incentives;
- large public R&D institutions;
- Science Parks;
- TT service centres (fully public financed).

B) Market Model:

- privatisation of public industries;
- market deregulation;
- liberalization and multi-national enterprises attraction;
- IPR regulation and national patent offices;
- private professional services;
- private technology brokers;
- private venture capital;
- private research companies;
- technological education centres;
- public information and benchmarking centres.

C) Governance Model 1 (public-private strategic partnership):

[33] Cappellin, op. cit., pp. 16-18.

- strategic planning contracts with large firms;
- territorial pacts with local actors;
- regional technological parks and centres;
- TT centres and programmes (partially publicly financed by national funds);
- University-industry liaison offices;
- professional continuous education centres;
- national programmes for R&D and innovation networks;
- national networks of TT service centres;
- national financial trusts for financing innovative firms;
- international networks of TT centres.

D) Governance model 2 (local networking and cooperation):

- cooperative research projects between SMEs;
- autonomous, non-governmental research institutions or foundations;
- Business Innovation Centres (BIC) and Innovation Relay Centres (IRC);
- TT centres of industry associations and chambers of commerce;
- local incubators of innovative firms;
- regional development agencies;
- local stakeholders coordination tables;
- territorial knowledge management (TKM);
- regional innovative start-up funds.

The first generations of innovation policy were linked to science and technology as the source of innovation. Innovation policy as such has typically not been a specific policy area, and will have difficulty in achieving a “place in the sun”, i.e. recognised and defended by a dedicated ministry.

The new generation of innovation policy involves a broader focus in which innovation is stimulated across a number of governmental or policy areas. It builds upon its horizontal role by providing a strategic framework across ministerial and institutional boundaries to ensure innovation and adaptation within the context of sustainable social and economic development. While innovation is typically viewed in terms of economic growth, a horizontal innovation policy will need to balance this imperative against other, sometimes conflicting, imperatives in policy areas such as social and environmental policy. Hence, countries will need a new framework for innovation policy in which broad and partly conflicting issues may be raised and dealt with.

The aim of the transition to the knowledge economy and the adoption of a governance approach seem to imply a change in the policy aim, instruments and

decision-making forms with respect to traditional industrial and innovation policies[34]. Changes include:

- adopting a learning – heuristic approach (bottom-up: system, horizontal, dynamic, evolution) versus an innovation – strategic approach (top down: structural, vertical, static, harmonization) in knowledge creation and diffusion;

- focusing not only on codified knowledge / information and technology diffusion (output indicators), but also on the development of know-how (tacit knowledge), on enhancing the interactive learning processes, and embedded capabilities (skills, competencies) (input indicators);

- adopting two additional frameworks: not only a firm or a sectoral/technology perspective but also a territorial/regional and an institutional perspective;

- focusing not only on the supply side or the increase of the production capabilities, but also on the demand side or on the satisfaction of the new needs of society (well-being, welfare, identity, social cohesion, living environment, sustainability) and on the political/institutional procedures ("how to do" rather than "what to do", institutions building rather than strategy design, the problems of conflict management, consensus, values, identities, ethical issues);

- having a larger scope than innovation/technological policies as they do not concentrate only on R&D financing and on financial support to research institutions and high tech sectors, while they adopt a wider policy agenda and an integrated approach aiming to integrate other economic policy domains (e.g. labour market, education, industrial, regional, trade policies etc);

- promoting not only diffusion and imitation of the top end/leaders in order to decrease the existing divides, according to a "linear approach" to technology transfer, but also development and inclusion of the bottom end actors/followers, according to a "systemic approach", considering also intermediate technologies, SMEs and the enhancement of medium or low qualified workers, while focusing on the role of key nodes and links in the knowledge networks;

- adopting a territorial knowledge management approach, focusing on enhancing the six levers: problem orientation, accessibility, receptivity, identity, creativity and entrepreneurship.

[34] Cappellin, op. cit., pp. 20-21.

A taxonomy of innovation policy could be presented in the following way:

Goals	Sectoral innovation policy	Multi-sectoral innovation policy
Innovation policy, i.e. aimed primarily at innovating industries and economic growth	Innovation policy in a limited sense (basically technology and industrial policies)	Integrated STI policies
Innovation policy in a wider sense, i.e. aimed at economic growth and quality of life	Innovation policies in other sectoral domains, e.g. innovation policies in health, innovation policies in the environment	Horizontal/comprehensive/integrated or coherent/ systemic innovation policies

Source: Pim den Hertog, Dialogic, Netherlands.

For instance, as regards the projects RIS – Regional Innovation Strategy and RITTS – Regional Innovation and Technology Transfer Strategies, whilst there have been many successes in strategies to better structure innovation policies in some regions, some evaluations of the projects showed the difficulties in achieving success in regions where some form of successful innovation system was not already in place. Indeed many strategy development processes fail through inadequate resources, limited political support, poor implementation and commitment, or conflicts with national policies.

Furthermore, the drive to engineer regional innovation systems has often led to myopia as strategy focused purely on the supply and demand for innovation support services within the region. Thus rather than conceiving the regional innovation system as an open and holistic system, it was seen as closed and narrow in scope. The consequences have been initiatives which have struggled to achieve success.

A number of policy challenges must be faced in preparing for future improvements to regional innovation policy[35]:

[35] Schienstock, Gerd et al. (1996) “Regional Innovation Systems: Designing for the Future”, REGIS project, Executive summary of final report, EC TSER programme - Work Research Centre, University of Tampere.

- **policy learning** which is two-dimensional: ensuring that regional bodies understand their own strengths and weaknesses as sites for promoting innovation; and comparing that situation with other regions, learning from their experiences, and adjusting lessons learned back to the context of the learning region.

- **policy communication and coordination** within the region, or the formation of regional "policy networks" is important for improving intra-regional policy coordination to support innovation. Bringing universities and other normally external bodies into such policy network arrangements is desirable.

- **policy bridges,** which encourage, through use of incentives, the graduation of firms from stagnating or declining sectors into ones with growth prospects, without making these bridges impossible by trying to leapfrog into wholly new, perhaps high-tech industries.

- **policy consensus** about action lines agreed by all the major regional stakeholders regarding the appropriate future innovation strategy to be pursued. This should then be monitored, evaluated and adjusted in line with changing policy conditions and evolving policy goals.

3.5. USE OF SYSTEMIC INSTRUMENTS

Innovation processes are in need of instruments that support functions operating at system level. In particular, the following five systemic functions can be distinguished: management of interfaces, building and organising systems, providing a platform for learning and experimenting, provision of strategic intelligence, and demand articulation[36].

There are strong indications that within the existing instruments portfolios there is a tendency to introduce more systemic instruments, but that the more traditional instruments (e.g. financial, diffusion, managerial) still heavily dominate the portfolio. The 'traditional' instruments only partially cover the five systemic functions mentioned above. They still take the individual organisation, usually the business enterprise, or bilateral relations as the unit of analysis. Furthermore, they hardly play a role as system builder and system organiser, and do not pay much attention to learning processes, platforms for experimentation or tailor-made strategic intelligence.

In short, this trend urges government to take part (and if necessary: take the lead) in the role of innovation system builder and organiser. Thereby, though,

[36] Smits, Ruud and Kuhlmann, Stefan (2004); "The rise of systemic instruments in innovation policy", Department of Innovation Studies, Utrecht University, in Int. J. Foresight and Innovation Policy, Vol. 1, Nos. ½., p. 25.

one should not overestimate the instrumental power of public policy vis-à-vis other actors in complex policy-making arenas. 'State' authorities in (regional, national, transnational) multi-actor arenas of innovation policy play an important, but not a dominant role. In many cases they perform more the function of a 'mediator', facilitating alignment between stakeholders, rather than operating as a top-down steering power.

Today instruments that function at system level[37] already exist which cover the following areas:

- The management of interfaces. Management of interfaces which cut across subsystem borders and stimulate debate.

- Building and organising (innovation) systems: initiate discourse, alignment, consensus. Prevention of lock-in, identification of and facilitation of prime movers ensuring that all relevant actors are involved.

- Providing a platform for learning and experimenting. Creating conditions for various forms of learning such as: learning by doing, learning by using and learning by interacting.

- Providing an infrastructure for strategic intelligence. Identifying sources (technology assessment, foresight, benchmarking) building links between sources, improving accessibility for all relevant actors and stimulating the development of the capacity to produce strategic information tailored to the needs of actors involved.

- Stimulating demand articulation, strategy and vision development. Stimulating and facilitating the search for possible applications, developing instruments that support discourse, vision and strategy-development.

3.6. PRACTICES IN REGIONAL INNOVATION GOVERNANCE: TRENDS AND ISSUES

Governance structures and mechanisms vary considerably. These are some of the trends identified in the last years with regard to practices in national and regional governance:[38]

a) Setting agendas and ensuring priorities: strategic innovation policy making.

[37] Smits and Kuhlmann, op. cit., pp. 11-12.
[38] OECD, op. cit., pp. 43-61.

Creating strategic frameworks. The framework should be guided by broad, but precise, visions. It should: integrate innovation as a driver in economic growth; address linkages and division of labour between ministries; provide directions for developing and implementing policy; address conflicting relations between key policy areas.

Strategic policymaking through councils. Governments often need to remedy structural deficits by creating new institutions to mediate between different government positions and priorities. Many regions (and countries) have been setting up science and technology policy councils to deliver authoritative, negotiated policy recommendations.

Consultation and stakeholders. An ever-emerging trend is the increased use of external bodies and committees that play a role in formulating and implementing policies. One key task for good governance is to ensure effective prioritisation and agenda setting for innovation policy. This function may suffer in the absence of an explicit body for long-term strategic policymaking such as a science and technology policy council or framework policies. The advantages and disadvantages of consultation are:

- Advantages: increases the user orientation of policies and consequently their effectiveness; invites more transparency on the rules of the game; de-politicises some contested decisions; facilitates networking between different stakeholder groups.
- Disadvantages: lengthens the decision-making process; increases the transaction costs of policymaking; composition of stakeholder groups can be skewed in favour of certain interest groups or positions.

b) Transforming agendas into implementation.

Dealing with complexity. The institutional set-up is extremely complex in many countries/regions, and governments will often need to adjust and simplify it in order to develop governable systems with acceptable coordination costs.

Institutional renewal to ensure implementation. Traditional governmental structures may not be able to solve the inherent priority problems, and new governance structures will be needed to ensure integration and consistent agendas. Because of organisational or institutional inflexibility, it is easier to create new governance structures than to try to adapt existing ones. The shift from institutional to more network and programmatic types of initiatives leads to more complex governance structures, as these help to weave an increasingly complex web of new and old players in the innovation system.

Decentralisation and accountability: the increasing role of agencies. The division of labour between upper and lower levels of government is changing, leaving the

upper levels (ministries) responsible for policy and the lower levels charged with coordinating a number of instruments often financed by separate ministries. In some cases this is linked to the need to reduce complexity and redirect the roles of institutions. The general process may be termed “agencification”. A critical question that arises is: to what extent are the agencies designed to promote co-ordination and increase coherence in the system?

Policy integration and linkages. Governments face the challenge of combining efforts for knowledge creation, diffusion and use in many domains, basically with economic growth in mind. Coordination and integration of policy objectives and instruments takes place within the context of a joint imperative, and policy components in each domain may build upon and reinforce each other. There is a great potential for linking innovation policy with other policy areas. However, even in such cases, many ministries and departments engage in the process based on their traditions, perception of their own area and competence, as well as perceptions of other policy areas. Typical issues that arise are:

- lack of understanding of innovation policy in other policy domains undermines communication in the coordination process;
- specific sectoral policies may be framed in ways that define others as rivals;
- strong political leadership is necessary to create a common vision and a legitimate basis for joint agendas.

The challenge of coordination. As governments attempt to respond to greater external and internal complexity and dynamism, policy coordination becomes the main vehicle for achieving improved coherence:

- Coordination mechanisms may be static and short-term rather than dynamic. This is particularly true when there is significant institutional fragmentation and short-term considerations dominate the agenda setting. Coordination may be reduced to annual budget-related decisions and decentralised to implementing institutions rather than serving to create long-term or strategic policy priorities.
- Designing coordination mechanisms takes time and requires financial support. Efforts to coordinate policy require a sense of urgency in order to affect policy governance. Without a sense of urgency, coordinating arrangements may fail, and the system may build up resistance to later attempts. If policy coordination leads to a perception of inability to follow up responsibilities in the line of command, coordination is likely to be associated with costs and will suffer.
- Well-functioning coordinating activities require personal leadership and commitment, and policymakers should take care to ensure supportive structures for person-based coordination activities.

c) Providing learning to policy processes.

Policy learning. Learning, evaluation and accountability all become more important as governance structures change and decision making becomes more complex. But the same trend increases complexity as well. Governments therefore need to find better ways to produce, disseminate and use policy-relevant knowledge. Evaluation of innovation policies and their instruments is indispensable to policy learning.

Emergent policy making. Such policy areas typically cut across sectors and ministries' competencies and represent a degree of comprehensiveness that exceeds the knowledge available for traditional governance practices. Emergent policy making is different from traditional, bureaucratic policy making and relies less on hierarchical control and information systems. It relies more on flexible, decentralised management practices, appropriate learning and flexibility. A high degree of self-organisation under a broader strategic objective from the top is typical.

Horizontal monitoring. Emergent policy making for comprehensive, cross-cutting policy areas requires well-developed information and learning systems.

Building more intelligence into policy making:

i. Various organisational mechanisms in place in most countries may enhance learning if exploited properly. Task forces, teamwork, etc., should be institutionalised to support a more learning-intensive governance style. Some regions engage in international learning beyond the usual exchange mechanisms, *e.g.* in international bodies like the Innovating Regions in Europe, Trend Chart, etc.
ii. Institutions for knowledge production and policy analysis are often linked sectorally to specific ministries and domains; this may reinforce a segmented culture that makes it difficult to produce coherent, policy relevant knowledge.
iii. Intelligence and policy learning may get a boost from the implementation of monitoring and reporting systems that improve the joint knowledge base for innovation governance.

3.6.1. Wielkopolska's Regional Innovation Council

The Wielkopolska Regional Innovation Council (RIC) is an advisory body that aims at building consensus among the regional stakeholders and providing the regional authority with ideas and opinions on activities to be undertaken for implementing the regional innovation strategies. The RIC activities are co-financed by a European Social Fund project within the Integrated Operational Programme for Regional Development.

The Council started operating in September 2006 when a Working Team was appointed to elaborate the statutes and to recommend candidates for Council

members. Local stakeholders were consulted about the proposed candidates during sub-regional meetings whereafter the Council was appointed by the Head of the Wielkopolska Region (Marshal) in November 2006. The Council is the reference body that provides advice to the regional authority on innovation policy issues and assists the authority in developing an effective regional innovation system.

RIC comprises 29 members representing chambers of commerce and industry, development agencies, business incubators, technology parks, large enterprises, business associations, R&D and education units, local authorities and sub-regional representatives designated by local stakeholders.

Six meetings of the Council have so far been organised on the following topics: diagnosis of the regional innovation system (preliminary results of RIS monitoring); regional good practices of collaboration between R&D units and companies; best practices from other European regions; projects of the Regional Operational Programme for Wielkopolska; and recommendations for the implementation of the Regional Innovation Strategy.

Four Working Groups were appointed within the Council addressing specific issues of the regional innovation policy:

- innovation awareness;
- clusters support;
- regional foresight;
- regional innovation system.

The Wielkopolska Regional Innovation Council has thus created a discussion forum to support the regional authority in its decision-making processes and to enhance regional innovation capacity by building consensus on priorities for regional policy. Its decisions have no legal force, as the Council acts as a regional opinion maker to advise and influence the decision-making process of the regional authority.

It is expected that the role of the Council in the Wielkopolska innovation system will evolve in the near future. So far the meetings of RIC have been promoted by the regional authority, which manages the Council. RIC could possibly go further by focusing more attention on bottom-up initiatives which require wider consensus and support to be implemented.

3.6.2. The Regional Growth Programme in East Sweden

The Regional Growth Programme was initiated by the Swedish Government in 1998. The promotion of regional competitiveness and growth in Sweden is the sum of a large number of actions all aiming at supporting economic, social, and

sustainable development in the regions. The regional growth programmes are an instrument to coordinate these available resources in close dialogue with trade and industry. The aim is that available resources, governmental funds and others, are used more efficiently in order to create greater benefits to business.

The East Sweden Regional Growth Programme has been developed and implemented in cooperation with all relevant stakeholders in the region: the Regional Development Council, County Administrative Board, ALMI Företagspartner (Development Agency), University of Linköping, the Labour Administration Board, the innovation finance provider Innovationsbron, and many other regional public and private organisations. The programme is based on regional and local needs of actions and is in line with national and EU policies. There is a direct link from the Lisbon Strategy to *the National Strategy for Regional Competitiveness, Entrepreneurship and Employment 2007-2013*, as well as the structural funds programmes relevant for East Sweden. The programme comprises a total budget of €30-40 million per year and is financed by government funds, national authorities and agencies (VINNOVA – the Swedish Governmental Agency for Innovation Systems, NUTEK – the Swedish Agency for Economic and Regional Growth and the Swedish Agency for Advanced Vocational Education) regional and local funds, EU-funds, and others such as Innovationsbron.

The previous East Sweden Regional Growth Programme was implemented in the period 2004-2007. The programme, which combines and coordinates resources to promote innovation and entrepreneurship, was based on a number of main priorities such as:

- entrepreneurship and creation of new businesses (e.g. spin-off companies);
- innovation infrastructure;
- labour market and skills development.

An important part of the process in East Sweden is a successful coordination of public money for innovation financing. The region shares a joint assessment and decision procedure with the public support system in order to simplify the access to finance and to support individuals and SMEs during the early stages of the their ventures.

The financial support consists of grants and different types of loans. ALMI Företagspartner, East Sweden County Administrative Board, and Innovationsbron all together invest a total of €1.4 million per year (not including national grants they coordinate). 180 new ideas and product development projects were supported in the period 2004-2007.

This group of organisations also links entrepreneurs and SMEs to venture capital and other sources of financing, and acts as the regional coordinator of national grants for product development. The group has therefore created a sustainable

system for the access to financing for innovations. Independently of which of the three actors is contacted, the client gets access to the joint resources. This demands a well developed system of cooperation in a wider sense – including both strategic and operative coordination.

Another priority concerns the strengthening of the infrastructure providing advice to new businesses. A network of business advisors covering the whole region has been established and maintained. There are also special programmes and measures for women entrepreneurs and immigrants, but integrated in the ordinary support infrastructure.

A special system for supporting new knowledge-based businesses through incubators linked to the two campuses of the University of Linköping has been implemented. The regional actors that support knowledge intensive companies in the start-up and growth phase cooperate in a model called *Growlink.* The different regional actors supporting Growlink facilitate access to funding, business support, and mentorship in the different phases of business development. The Growlink model concentrates on the idea, start and growth of a company supporting the different development phases from the original business idea to the formation of a sound company.

Another important line of action within the East Sweden Regional Growth Programme is the promotion of young entrepreneurship through the development of positive attitudes and knowledge about business and innovation. Projects are financed in order to stimulate entrepreneurial activities in schools in every municipality of the region, engaging politicians, headmasters, teachers and students throughout the school system from preschool to the university level.

The Regional Growth Programme in East Sweden has consequently set up an efficient, comprehensive business and innovation support supply system based on a functional and informal governance system that makes all stakeholders work in the same direction in close cooperation on the operational level.

4. MULTILEVEL GOVERNANCE

Multilevel Governance can be described as the dispersion of policy decision making across multiple territorial levels. European, national, regional, and local spaces are increasingly dependent on one another. The shift of decision-making authorities, competences and resources to the European levels, as well as to global policy networks has far-reaching repercussions for national and regional contexts. Simultaneously different policy domains are overlapping. The innovation field is certainly one of them.

Two phenomena have been decisive in creating multilevel governance in Europe over the last decades: on the one hand, European integration has shifted authority of innovation policymaking from national states up to European level institutions; on the other hand, regionalisation in several European countries has shifted political authority from the national level down to sub-national levels of government.

In particular, decentralisation has made local and regional governments more powerful and increased their capacity to formulate and deliver innovation policy. These trends have made governance of public policies both more complex and more demanding, involving multiple actors (public and private) and requiring a rethinking of how central and sub-national governments should collaborate.

Two main dimensions can be considered when talking about multilevel governance: vertical and horizontal. The “vertical” dimension refers to the linkages between higher and lower levels of government (e.g. between ministries and agencies or between ministries and regional administrations). The "horizontal" dimension refers to the coordination of many policy domains to achieve better innovation policy, involving both a broadening of goals beyond core innovation policy and a multi-sectoral approach.

In particular, regionalisation and decentralisation processes have led to the allocation of more financial resources for local and regional governments. In the last decade, there has been a significant increase in the share of investment under the control of regional and local authorities in the European Union.

Sub-national levels of government have thus increased their capacity to formulate and deliver policies, which can be demonstrated by several facts:

- In Spain, the evolution of the budget of the Spanish Autonomous Communities almost tripled from 1995 (€49,000 million) to 2005 (€133,000 million).

- In France, the number of communities (i.e. inter-municipal associations) with own fiscal resources has increased from 1102 (1995), to 1845 (2000) and to 2524 (2005).

- In new EU Member States, regionalisation has seen the light of the day in a number of countries: Poland – 16 regions created in 1999; Czech Republic – 14 regions established in 2001; Slovakia – eight regions formed in 2002; Slovenia – 14 regions are to be created in 2009.

While there are important cross-national variations, the decentralisation process is continuing in Europe. Local and regional governments have become major actors in the European economies. Nowadays, their expenditure accounts for 12.7% of GDP. The local and regional public sector is the leading public investor ensuring 64% of all public investment. Furthermore, local and regional fiscal resources are growing, mostly to compensate the financial costs of the new responsibilities: +4.5% per year in volume over 2000-2005.

The dimension of the sub-national levels of government in Europe is clearly demonstrated by this figure: there are currently around 89,200 territorial governments in the EU, including three federal countries, and 22 unitary countries organised in one, two or three tiers: eight countries with one level; eight countries with two levels; and six countries with three levels:

EU MEMBER STATES' ADMINISTRATIVE TERRITORIAL STRUCTURE

	1st level	2nd level	3rd level
FEDERAL STATES			
Austria	2,358 *Gemeinden*		9 *Länder*
Belgium	589 *communes*	10 *provinces*	6 *communautés* and *régions*
Germany	12,431 *Gemeinden*	323 *Kreise*	16 *Länder*
UNITARY STATES			
Cyprus	377 (24 *municipalities*/353 *communities*) [1]		
Czech Republic	6,248 *obec*	14 *kraj*	
Denmark	270 *kommuner*	13 *amter*	
Estonia	227 (194 *vallad*/33 *linnad*)		
Finland	432 *kunta*		
France [2]	36,784 *communes*	100 *départements*	26 *régions*
Greece	1,034 (914 *demos*/120 *koinotita*)	50 *nomoi*	
Hungary	3,145 *települések* [3]	19 *megyék*	
Ireland	85 (5 *city councils*/75 *town councils*/ 5 *borough councils*)	29 *county councils*	8 *regional authorities*
Italy	8,101 *comuni*	103 *province*	20 *regioni*
Latvia	527 (7 *republikas pilsetas*/53 *pagats*/ 34 *novads*/433 *pagasti*)	26 *rajoni*	
Lithuania	61 *savivaldybes*		
Luxembourg	116 *communes*		
Malta	68 *municipalities*		
Netherlands	458 *gemeenten*	12 *provincies*	
Poland	2,478 *gminy*	314 *powiaty*	16 *wojewodstwa*
Portugal [4]	308 *municipios*		2 *região autònoma* (Madeira and the Azores)
Slovakia	2,891 *obec* [3]	8 *vyssie uzemne celky*	
Slovenia	210 *občina*		
Spain	8,110 *municipos*	50 *provincias*	17 *communidades autonomas*
Sweden	290 *kommuner*	20 *landsting*	
United Kingdom	404 (239 *districts*/ 165 *unitary authorities*)	34 *counties*	2 *devolved nations* (Scotland and Wales) and 1 *devolved territory* (Northern Ireland)
EU 25	**88,002**	**1,125**	**123**

Source: European Commission.

4.1. MULTILEVEL GOVERNANCE CHALLENGES

Multilevel governance is a key challenge for the states and regions**:** how to establish conditions for a self-governing process of interactive learning between innovation system actors? How to decentralise power from national level to regional/local and to delegate certain tasks from formal government agencies to business associations?

While multilevel governance may bring risks, demands and constraints to the regions, emerging opportunities for regions can be identified as multilevel governance expands. With regional/local authorities in the driving seat, regional/local authorities can be the managers of change and achieve more bottom-up policy making.

The degree of multilevel governance (i.e. the "number of levels") may vary quite significantly amongst the countries and may depend on several factors, such as regional dimension, level of decentralisation, and dispersion of competences amongst the different levels of the Administration. For instance, there are countries where the decentralisation process is rather advanced (e.g. Germany, Belgium, Austria, Spain, Italy), while some countries are relatively centralised (e.g. several new EU Member States). Last but not least, within the EU, the size of a number of small countries is comparable to the size of regions in the large countries.

4.1.1. Innovation policymaking in a multilayer governance system – the case of Castilla y León

Spain is a decentralised country where regions (called "Autonomous Communities") have a high degree of self-government with their own directly elected parliaments and governments. The Spanish Constitution states which competences are exclusive of the State and which can be transferred to the regions. Innovation policies have been transferred to the regions, while the State keeps the general coordination of research policy.

The regional RTDI policy is based upon three main pillars:

1. Law for the promotion and coordination of scientific research, technological development and innovation (Law 17/2002);
2. The Science & Technology Coordination Commission, chaired by the Regional Government's President and formed by representatives from all regional ministries involved in RTDI activities.
3. The Regional RTDI Strategy, which contains the programmes and measures related to the activities carried out by all regional ministries during a period of time that should coincide with the EU budgetary programming periods.

The Science & Technology Coordination Commission elaborates the Regional RTDI Strategy, which must be formally approved by the Regional Government. The main regional stakeholders of the RTDI system (universities, research centres, individual researchers, technology centres, science and technology parks, business incubators and, especially, companies) have participated in the elaboration of the strategy through a number of round-table debates and through a previous consultation process called “Economic and Industrial Competitiveness Forum”, which involved about 700 experts. Furthermore, establishing an Advisory Council to the Science & Technology Coordination Commission, formed by representatives of the above-mentioned stakeholders is foreseen.

The Science & Technology Coordination Commission is also responsible for the coordination of the activities performed by all the regional ministries in this field, and the evaluation of the Regional RTDI Strategy.

The figure of the regional Commissioner for Science and Technology was recently created to take charge of the daily coordination and monitoring of the regional policies on RTDI and Information Society, and the establishment of links with the other regional policies. The Commissioner is to have some competences regarding allocation of budget to Science & Technology.

The articulation of regional and national policies is defined by the national legislation. The General Council for Science and Technology has the participation of the RTDI national and regional ministers. It is a political, high-level body within which two other committees have been created: the Working Group, participated by the General Directors of the regions and the National Ministry; and a Technical Working Group for information exchange between the Ministry and the regions.

Regions are also invited to take part in national committees related to the management or monitoring of the National RTDI Plan, namely the commissions for the elaboration of the plan, plan monitoring committees, etc. National ministries may also call for informal meetings with regions (usually the most relevant ones, depending on the subject), to discuss about future policy actions. There are also bilateral meetings between the State and a specific region to deal with specific matters. The State may sign bilateral agreements with regions to implement national programmes in each region in conjunction with the regional government. The central government may co-finance activities or simply deliver national funds to the region.

It is worth highlighting the recent implementation of the Monitoring and Evaluation Integrated System (“SISE” in Spanish), a web-based information tool intended to hold all the information concerning the national RTDI Plan (calls for proposals, results of the calls, approved projects, etc), which has been opened to include also the same kind of information from regional plans, so that all the information of RTDI in Spain can be found on just one site.

Like many other regions, Castilla y León has an office in Brussels, which is in charge of informing the regional government about the activities undertaken in the European institutions that could be of interest to the region. The office is also responsible for lobbying activities before the European institutions. The activities of the office in the RTDI field were reinforced in 2006 with the establishment of ADEuropa Foundation, a public organisation depending on the Regional Ministry of Economy and Employment, whose goal is to increase the participation of regional entities (companies, research and technological centres, universities, etc.) in European programmes, especially in the Seventh Framework Programme for Research and Development.

4.2. EUROPEAN MULTILAYER GOVERNANCE SYSTEM

The European layer of governance has become very relevant for regional innovation. Apart from the development of broad based innovation strategies for Europe, which have fostered innovation as a main asset of the EU economy, the European Union offers the regions important resources for the implementation of their innovation policies. This is the case of the Structural Funds, which have an increasing innovation component; the Framework Programmes for Research and Technological Development that place a strong focus on innovation; and the Competitiveness and Innovation Programme, which supports innovation activities in companies.

The EU offers also innovation policy learning opportunities through initiatives such as the Innovating Regions in Europe; the PRO INNO Europe (analysis and benchmarking of national and regional innovation policy performances); and Europe INNOVA (platform for innovation professionals to exchange and test good practices in different industrial sectors), among others.

Programmes such as INTERREG (creation of relationship capital and horizontal business networks bringing together experts, partners and customers) and Innovative Actions (testing of models that facilitate the process of knowledge capitalisation in the regions) have brought tangible and intangible benefits to regional stakeholders and local innovation systems.

There are a number of key elements analysed by the Working Group members that determine how regions take advantage of European funding and, particularly, Structural Funds:

- existence of a regional innovation strategy;
- development stage of the regional innovation system;
- structure of the regional economy;
- low, medium or high level innovation region;
- regional priorities;

- matching and interconnection within a regional framework.

To have a clear vision and a coherent regional innovation policy was considered by the Group members as more important than being a large, economically powerful region or than simply carrying out lobbying activities to influence the European decision making level.

There is no legislation establishing cooperation or coordination procedures between regions and the European Commission, as officially the EU counterparts are the Member States and not the regions. The exception could be the European regional policy, but even in this matter most of the contacts are held through national authorities.

One of the most important ways for regions to be heard at the European level is the Committee of the Regions, a political assembly that provides local and regional authorities with a voice at the EU. The Treaties oblige the Commission and Council to consult the Committee of the Regions whenever new proposals are made in areas that have repercussions at regional or local level, which gives the regions an opportunity to have a say in the development of new laws in the EU.

Another interesting opportunity for regions to participate in the EU decision making process is the European Union Parliament and its various Committees (e.g. Industry, Research and Energy; Regional Development etc). These committees draw up and adopt reports on legislative proposals for Parliamentary plenary sessions.

The participation in national and European networks and associations may also be an effective strategy for regions to increase their visibility in the European multilayer governance system. The establishment of regional representations in the capitals of the respective countries and in Brussels may also be a useful approach.

The role of national governments is also of utmost importance for the regions. National governments have most of the funding for science, research and innovation. They also channel Structural Funds from the EU level to the regions. The use of mechanisms for collaboration with multiple actors at the national governance level (public and private) may therefore be extremely important for the regions, which may include joint innovation councils or forums, formation of steering/advisory groups, and cross-sectoral strategies.

There are no standard recipes for regions to integrate themselves perfectly in multi-level governance (MLG) systems. There are significant differences of dimension, internal systems of government, cultures, strengths, weaknesses, etc. Regions should therefore consider the different options and solutions that suit their needs best.

4.3. MULTILEVEL GOVERNANCE VS. REGIONAL INNOVATION SYSTEMS

Regions face a number of challenges, advantages and disadvantages for taking part in a European multilevel governance system.

One of the main challenges for the regions is to be able to take the best part of each level of the MLG system for the benefit of their innovation systems, avoiding duplication of efforts and unnecessary redundancy.

For regional innovation systems and their members, the challenge is to not get lost in the complicated grid of support systems, and to be able to identify the most suitable support schemes for their characteristics and needs.

Challenges that regions may face include aspects like:

- dealing with the complexity of an MLG system;
- avoiding duplication of efforts;
- identifying “who” does “what” at the different levels;
- risk of missing opportunities in the various levels.

One of the main advantages of a multilevel governance system is that a wide partnership involving stakeholders at European, national, regional and local level may be a good formula to allow all relevant knowledge and resources to be mobilised where it is most appropriate. This may help reduce uncertainty and allow policy responses to be tailored to the specific needs of particular countries or regions.

Another potential advantage for the regions can be “specialisation”. This idea is in line with the subsidiarity principle by which decisions are taken as closely as possible to the citizen. The European Union does not take action (except in the areas which fall within its exclusive competence) unless it is more effective than action taken at national, regional or local level.

Each layer of government should be able to identify which actions they perform better than anybody else, and concentrate on them, leaving the rest to the other government levels. For instance, in general terms, it is recognised that excellence in scientific research needs certain critical mass, which can more easily be achieved at national or European levels than in individual regions.

On the contrary, it is often considered that innovation policies are better addressed from a regional point of view, since many factors hampering or fostering innovation (but not all of them), take place locally. However, in an increasingly globalised world, it seems clear that there is room for wider innovation policies tackling the challenges of globalisation.

Regions have the opportunity to concentrate their efforts on the promotion of activities in those regional scientific or technological areas that are not a priority at national or European level. For instance, areas that are important for supporting the local economic fabric or areas where there is local scientific excellence.

Another area where regions may have an advantage in comparison to other governance levels is the provision of innovation support infrastructures to companies, which are adapted to the local characteristics and idiosyncrasy. Regions can also help create local clusters and networks, and support less innovative companies, which can be considered important at regional level, although they would not receive funding in competitive calls in national or European programmes because of their relative low innovativeness.

The role of the European Union could be the boosting of excellence and the promotion of large, mobilising projects on cutting-edge technologies, which could have a positive impact in terms of competitiveness in the EU as a whole. The creation of European networks is clearly another main task that is to be undertaken at a transnational level. It may be based exclusively on excellence criteria, but also on territorial cohesion looking for knowledge transfer and a balanced development of the European Union. The exchange of experiences between regional policy makers is another key point that must be promoted by national and European authorities.

The role of national authorities appears to be in between these two levels (i.e. local/regional and global), as national governments don’t have the proximity to local economic tissues, or enough size to guarantee critical mass in global markets. As it has already been stated above, EU Member States differ greatly in size, administrative organisation, and economic development, so their position in a local-global axis may vary a lot. Their role seems to be determined by these factors but, if a common feature is to be found for all of them, this could be the coordination between the local/regional and the global levels of governance. In practical terms, this means, for instance, the creation of national clusters and networks that will be more visible than regional ones at European level, or the promotion of collaborative projects with rules similar to those of European projects, which will help companies to be familiar with the procedures.

The main disadvantages brought by multilevel governance relate to the complexity of the system and costs of coordination. Very often understanding the whole system is not an easy task for managers (e.g. public administrations) and users (actors of the innovation systems).

Multilevel governance may also lead to the loss of opportunities for the players that are less adapted in working in complex environments (i.e. SME, less favoured regions, etc). In contrast, entities or regions that are more developed and experienced may be favoured by such a system. As a consequence,

additional efforts may be needed in order to allow less experienced regions and their players to participate in national and European programmes, which could be covered, for instance, by regional cohesion policy instruments.

Multilevel governance systems are also very likely to cause duplication of efforts between the different administrations involved as coordination between them may be difficult. While it is true that multilevel governance may allow more versatility and adaptability in meeting the needs of a broader range of entities, and can therefore be more effective, it may not necessarily be more efficient, because of the costs associated to such complexity.

4.4. REGIONAL INFLUENCE IN THE EU DECISION-MAKING SYSTEM

The influence that a region can exercise on the EU decision-making system is extremely limited. This is the reason why there are a certain number of associations of regions, as well as official bodies that represent the regions before the EU institutions. The Innovating Regions in Europe network would be an example of the first type, while the Committee of Regions would be an example of the second type.

If a region wants to increase its influence in the EU decision-making system, it must gain visibility before the whole decision-making system. This can be done with “classical” lobbying activities to influence politicians and officials, and by participating as actively as possible in meetings, networks, associations, etc, not only in Brussels, but also nationally.

However, increasing visibility may not be enough. The region may also have to prove that it has been successful in the development and implementation of its innovation policies. This is demonstrated with consistent policies and strategies, concrete results, and clear visions for the future.

Several mechanisms were proposed by the Working Group members to enhance the linkages and coordination between governance layers. These included:

- laws and regulations determining who’s doing what;
- funding schemes and other financial incentives to innovation channelled from higher into lower layers;
- Science and Innovation Councils bringing together representatives from different levels (e.g. national, regional and local);
- formal, written documents to make policies clear to the various layers of governance;

- staff exchange and secondment schemes between the levels;
- lobbying and related activities to influence higher authoritative decision making levels (e.g. European and national);
- complement national governments' initiatives and funding with regional participation in European programmes (RTD FPs, CIP, etc);
- regular events on innovation bringing the different governance levels actors closer together;
- establishment of learning structures for the exchange of experiences (learn from the best and from others' failures);
- networks (e.g. groups, consortia, alliances, clusters, etc).

5. RECOMMENDATIONS BY THE WORKING GROUP

Many hands-on, practical-oriented recommendations have been proposed by the Working Group members regarding the strengthening of regional innovation systems. These recommendations are based on experiences and lessons learned from policies, programmes, projects and other initiatives carried out in the Working Group regions and reflect the diversity of internal systems of governance, dimension, economic development, cultural settings and other framework conditions within the Group member regions.

The list below is an attempt to briefly present all the proposals and advice that have been provided by the Working Group members throughout the meetings held from November 2006 to February 2008. Further information on innovation policy recommendations suggested by the Group members can be found in presentations, papers and minutes available on the IRE website.

1. **Consult the stakeholders.** One key task for 'good governance' is to ensure effective prioritisation and agenda setting for innovation policy. This function may suffer in the absence of a specific body for long-term strategic policymaking such as an innovation steering committee. The use of external bodies and committees that play a role in formulating and implementing policies may increase the user orientation of policies and consequently their effectiveness, and facilitate networking between different stakeholders.

2. **Engage different regional actors** in boosting the innovation systems and strategies and give power to them by providing them with specific roles and appropriate resources for action. Define their roles clearly instead of encouraging competition among them, in particularly between those belonging to the innovation support subsystem (e.g. universities, R&D institutes, business associations, technology centres, financing institutions, etc).

3. **Encourage cooperation** between the innovation system actors and promote trust among all of them. Create and maintain channels and processes for cooperation and information flow between the different stakeholders (e.g. innovation networks, innovation councils, steering groups, task-forces, events, study visits, etc).

4. **Avoid fragmentation.** When developing any innovation strategies/plans pay attention to and try to bring together activities that are somewhat separate from each other. Do not get fragmented during the process. A combination of top-down and bottom-up approaches should preferably be applied; the top-down approach to have a clearer vision of the big picture and the bottom-up approach to maintain concrete outcomes.

5. **Improve regional coordination.** In order to respond to greater complexity of the innovation systems, regional innovation governance becomes the main vehicle to achieve enhanced coordination. Coordination mechanisms (addressing both the engagement of the various regional stakeholders and the synchronization of different policy domains) may include for instance policy councils/platforms, government committees, networks (including informal networks), task-forces, steering/advisory groups, white papers, forums, sectoral strategies, action plans, communication plans, new executive bodies, monitoring programmes, etc. Designing coordination mechanisms takes time and requires financial support.

6. **Analyse, plan, finance, create and coordinate.** Undertake analysis together with professional, external experts. Develop plans for a number of years and provide financing and stability for the same time horizon. Create suitable, professional structures for action implementation.

7. **Communicate your initiatives.** Continuous communication with the regional innovation system players improves effectiveness and efficiency of offered innovation support services. Clearly articulated innovation strategies and measures should be regularly communicated to the whole system. A strong and consistent message will help institutions and people to stay connected and believe in the importance of the actions undertaken.

8. **Ensure strong and legitimate leadership**. The involvement of regional and local leaders (public and private, institutions and individuals) helps promote strong innovation awareness, and ability to mobilise local/regional groups for innovation activities. Organisations in charge of implementation of action proposals must be named and agreed on for the proper setup of the responsibilities of implementation. Furthermore, well-functioning coordination activities require personal leadership and commitment, and policymakers should take care to ensure supportive structures for person-based coordination activities.

9. **Seek stability.** Effective innovation systems need stable policies, strategies and resources. Long-term objectives and core directions should not be put at stake with elections and new political cycles. Stability builds trust and stimulates involvement of regional innovation players. Long-term commitment of regional politicians and leaders is a very helpful contribution to sound innovation policies and strong innovation systems.

10. **Facilitate regional empowerment.** Involve regional stakeholders and share tasks with them, engage regional champions, create consensus, get political backing from politicians and stakeholders, boost governance by intensive communication/networking, and deploy as far as possible suitable financing and human resources.

11. **Promote client-oriented innovation systems**. The innovation support needs of firms should be examined in a systematic way in order to promptly mobilise the right actions and resources from regional authorities and innovation support organisations towards new or fine-tuned services. The identification of such needs can be done using tools such as innovation demand surveys, market analyses, competitive intelligence actions, foresight exercises, among others.

12. **Develop a regional shared vision.** A regional vision statement can galvanise local stakeholders to achieve defined objectives. To be successful the vision must be shared and supported and should stimulate all the concerned regional players and help them feel motivated and part of something of extraordinary importance. Involve the stakeholders in the definition of such vision, gather input from them in order to shape their aspirations into a coherent vision, and help concerned actors see the important role that they play in turning the vision into reality.

13. **Link innovation policy to other policy domains.** Governments and regional authorities face the challenge of combining efforts for knowledge creation, diffusion and use in many policy domains, basically with economic growth in mind. There is great potential for linking innovation policy with other policy areas.

14. **Create new bodies** to smooth over the development of innovations systems. Governments may need to remedy structural deficits by creating new institutions to mediate between different government fields and priorities. Many regions and countries have for instance been setting up innovation policy councils or agencies to facilitate the delivery of innovation policies.

15. **Prepare to be part of multilevel governance systems.** More important than undertaking lobbying and “marketing” activities in order to influence higher authoritative decision making levels (e.g. European and national), regions should make an effort to establish long-term policies and strategies with demonstrable impact as a way to better communicate and interact with other governance levels. A number of mechanisms can be used in order to enhance the coordination with other governance levels like laws and regulations, formal documents to express policies, innovation councils, funding schemes, staff exchange, etc.

16. **Plan the use of EU Structural Funds.** Structural Funds can be a main vehicle for promoting systemic regional innovation, particularly in less favoured regions. The use of funding from Structural Funds within regional operational programmes may be a main tool for these regions to shape

and develop their innovation policies and strategies, thus boosting their innovation systems.

17. **Adopt a "learning innovation policy" approach.** Learning, evaluation and accountability all become more important as governance structures change and decision making become more complex. There are no innovation policy models, only trial-and-error processes. As a consequence, understanding the relevance and effects of innovation policies are absolutely essential. Regional governments and authorities therefore need to find better ways to produce and use policy-relevant knowledge.

18. **Monitor and evaluate your achievements.** Innovation policies without sound monitoring and evaluation do not make sense. Monitoring and evaluation of regional innovation systems are necessary to optimise and set priorities for the system. Increased monitoring activities increase insight into the impact of funding schemes and single subsidised projects. Monitoring and evaluation tools should be applied continuously in order to better understand the impact of RTDI policy and innovation support measures in the economic performance of the region. In these processes, it is important to set clear objectives and milestones to evaluate the progress of the implemented measures.

19. **Benchmark.** While economic, institutional and historical context is very important, it is possible to learn from other regions and countries. Strengthened trans-regional cooperation enables the transfer of proved and appropriated methodologies. However, there are no blueprints for effective regional innovation systems and there is no express train from the Stone Age to the future! Benchmarking methods should be applied by regions wishing to go further in exploiting the diversity of European regions in innovation policy not limited to "best practice" approach which often leads to marketing presentations of non-transferable instruments.

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ANNEX 1

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ANNEX 2

List of regional practices