

National overviews of regional innovation policies and case studies in the Nordic countries

Sigrid Hedin, Riikka Ikonen, Veli-Pekka Tynkkynen,
Ingi-Runar Edvardsson and Regina Gunnarsdottir

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Nordregio
P.O. Box 1658
SE-111 86 Stockholm, Sweden
nordregio@nordregio.se
www.nordregio.se
www.norden.se

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Preface

This working paper is the final result of the project *Regional tilpasset innovationspolitik i Norden* commissioned by the Nordic Senior Officials' Committee for Regional Policy, the Nordic Council of Ministers. According to the project description the main question to be answered was:

- How can national policymakers in Norden apply the Lisbon Agenda goals in respect of the desire to create regional innovation policies (referring to policy areas which set the framework conditions for innovation, i.e. growth, entrepreneurship, industrial, regional development, research and education and infrastructure policies) that are fully adapted to the Nordic context?

The project work group consisted of the following members:

Alexandre Dubois, Nordregio
Ole Damsgaard, Nordregio
Ingi-Runar Edvardsson, University of Akureyri
Sigrid Hedin, Nordregio
Riikka Ikonen, Nordregio
Kaisa Lähteenmäki-Smith, Nordregio
Jörg Neubauer, Nordregio
Katarina Pettersson, Nordregio
Daniel Rauhut, Nordregio
Johanna Roto, Nordregio
Veli-Pekka Tynkkynen, Nordregio
Åke Uhlin, Blekinge Institute of Technology and Vestfold University College

The project reference group members were as follows:

Lone Neldeberg and Stig Nielsen, Danish Enterprise and Construction Authority, Denmark
Maunu Harmo and Hannu Lipponen, Ministry of Trade and Industry, Finland
Berglind Hallgrímsdóttir, Impra - Innovation Centre IceTec, Innovation Relay Centre / Iceland and Sweden, Iceland
Jan Sandal, Ministry of Local Development and Regional Development, Norway
Marina Fransson and Örjan Hag, Ministry of Enterprise, Energy and Communications, Sweden
Heidi E. Sonne-Clifford, Erhvervskontoret, Greenland Home Rule
Niels á Velbastad, Faeroernes Landstyre
Steinbjørn í Dali, SamVit, Faroe Islands Enterprise
Mika Rantakokko, Nordic Innovation Centre

This working paper was developed by the following work group members:

Governance of regional innovation policy in Denmark: Sigrid Hedin
Governance of regional innovation policy in Finland: Veli-Pekka Tynkkynen
Governance of regional innovation policy in Iceland: Ingi-Runar Edvardsson and Regina Gunnarsdóttir with assistance from Berglind Hallgrímsdóttir
Governance of regional innovation policy in Norway: Riikka Ikonen, Veli-Pekka Tynkkynen and Sigrid Hedin
Governance of regional innovation policy in Sweden: Riikka Ikonen

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Executive summary

In recent decades increasing emphasis has been placed on the notion of innovation across various policy fields. The main explanation for this is that “innovation” is now regarded as a central component of the ‘knowledge economy’ and as vital in meeting the challenges posed by the emergence of truly a global economy. As such, each of the Nordic countries have made an effort at both the national and regional levels to promote the notion of innovation, not only in industrial terms but also in respect of research and administration.

This Working Paper provides an overview and analysis of Nordic innovation policies of relevance to regional innovation systems by investigating the policy making processes and policy practice of innovation policies in the Nordic countries. In the national overviews and case studies for each Nordic country recent national and regional innovation policies are reviewed. Moreover, the policies and their practical implications at the regional level and the relationships between innovation policies and regional policies, and to some extent rural policies also, are highlighted.

Innovation policy in the Nordic countries initially emerged from the R&D policy sphere. Innovation policy’s regional dimension can be summarised in the following manner, both an innovation policy sphere with regional dimensions and a regional policy sphere with innovation dimensions can be said to exist. Nordic (regional) innovation policies undoubtedly display both similarities and differences. It is, moreover, obvious that the state has historically controlled innovation policies in the Nordic countries even where these policies have regional elements and national establishments at the regional level. Norway has probably gone through the most explicit process of regionalising its governance structure in respect of innovation policy.

Common for all the countries is the notion of encouraging networking and partnership in one way or another. As such, in Finland, Norway and Sweden the idea of having “Centres of Expertise” which are expected to have a central role in developing regional innovation systems is now firmly embedded. These programmes have however been concentrated in regions which already display good potential in respect of being leading growth centres.

The partnership idea is clearly implemented in both national regional policies and innovation policies. New cooperation forums for actors have been established - the *Danish Innovation Council* is a good example of a forum that has members from many different sectors. The ‘triple helix’ concept is also used across the Nordic countries.

All Nordic countries have adopted the broad approach to innovation or have at least taken the initial steps towards doing so. Nevertheless, innovation policy in the Nordic countries retains a particular focus on high-tech industry and, as such, the traditional emphasis on manufacturing industry as compared to the service sector continues.

Specific measures addressing weaker regions do exist but in principle all regions now have access to the same tools. In addition, all regions are now encouraged to make use of their endogenous strengths instead of having regional policy directed to weaker or less developed regions. In general it can be noted that regional innovation policies in the Nordic countries have the tendency to favour already strong and competitive regions. This statement is based on the fact that many programmes are designed as competitions, where the “best” proposal receives the funding.

The five case studies reproduced here offer a slightly modified picture of the overviews found in the national reports. The *Danish* case study “*AluVaekst - A Regional Technology Centre in Region Syddanmark*” covers the measure *Regionale teknologisentre* (RTC) belonging to the action plan “Knowledge moves out” from 2004. The measure can be classified as innovation policy with regional elements. The centres focus on strengthening the regional competences of special importance for regional business life and they function as mediators between research institutes or higher education institutes. This type of cooperation is based on the notion that access to knowledge and competence development are seen as vital to

businesses in the periphery in order to help them become more innovative and competitive. The objective is thus to increase competence levels in the regions and through this to increase innovation and growth within the business sector. The selection process for the RTC is competitive. Actors involved correspond to the 'triple helix' approach, namely, knowledge institutions, public actors and small and medium-sized companies. The financing of the centre is set for a four year period and comes from national, regional and local actors. Some of this local and regional financing must come from the private sector. The measure is constructed for non-metropolitan areas in particular while the centres are encouraged to build on their regional strengths and development potential. The demand for regional anchoring is also strong. The particular RTC discussed in the regional context of Syddanmark works with the aluminium industry with the overall aim being to develop new uses for aluminium. The specific RTC is based on previous cooperation. There is however a rather weak regional anchoring here in the sense that the measure is not addressed explicitly in any regional development plans.

The *Finnish* case study covers the issue of how the Centre of Expertise programme has developed in the Oulu region. This instrument belongs to the category innovation policy with regional dimensions. The objective of the CoE programme is to benefit regional enterprises and develop competitive businesses around knowledge expertise. The CoE selection process is competitive. The actors involved are again those characteristic of the 'triple helix' concept. The CoE programme has been running in Finland for more than a decade. So in this case study it is possible to follow the development of a measure for a period of around 15 years. The current programme is the third and corresponds to the EU Structural Funds period 2007-2013. The financing of the Centre is divided between the state, regional and local actors. The CoE programme has a strong regional connection in the way in which a connection exists to the Regional Centre Programme. In addition, the CoE programme in Oulu is explicitly included in the Oulu Growth Agreement. In addition it is also stipulated that the effects generated by the CoE should be diffused to the surroundings of Oulu through the *Multipolis* network. The Oulu case also displays interaction between the regional/local and the national level, since the practice developed in Oulu influenced the general development of the CoE programme. It is also possible to see a development from forestry to high-tech, and a movement from primarily stressing technological innovation towards an increasing emphasis on the business application of innovations.

In the *Icelandic case* "Growth Agreement in the Eyjafjörður region" attention has been paid to a regional initiative developed in this region. The objective of the growth agreement is to promote the region as an attractive place to live, to increase the number of inhabitants and to strengthen the regional economy. The agreement was inspired by the Growth Agreement developed for the Oulu region. In the Icelandic context the agreement is an "innovation" in itself as well as being an agreement that aims to facilitate innovation by establishing four clusters and enhancing existing cooperation between private and public actors in the region, i.e. companies and higher educational institutions. The agreement has been established on a partnership basis involving public and private actors from the national and regional/local levels. The financing of the activities undertaken comes from the state, as well as from regional, local and private actors. The timeframe for the agreement was three years, running through the 2004-2007 period. The regional dimension is rather obvious since the agreement is established for a specific region. In addition, a cluster approach is used. Despite the adoption of the regional approach the clear ambition remains to also include international actors in the activities. This agreement has in addition functioned as a role model for those agreements recently established for other Icelandic regions.

In the *Norwegian* case study parts of SIVA's innovation infrastructure has been investigated in the Oppland region. Characteristic of SIVA's innovation infrastructure is the fact that it tends to offer instruments for different kinds of geographical contexts. Special focus has been placed here on the measure *distributed incubators* and the interplay between science parks, 'business gardens' and incubators. These instruments in part belong to the

innovation policy field but there remains a strong connection to regional policy since a business garden is used as an instrument to develop local business life, by supporting 'start ups' and promoting the expansion of SMEs in Norway's more peripheral regions. Special attention is also paid to gender and youth issues, in order to keep /attract these groups to peripheral regions. To become a business garden an application has to be submitted. In the process both private and public actors are involved, coming from the national, regional and local levels. The financing comes from the above-mentioned stakeholders. The existing business garden programme runs for 4 years. In the case investigated here a strong local and regional connection exists since the business garden is already integrated into local and regional development plans and work. Oppland county municipality moreover enjoys strong representation from all of Norway's "innovation actors" i.e. SIVA, *Innovation Norway* and the Norwegian Research Council. These actors have been co-located to an "innovation centre". It can also be concluded that there is a strong connection between different instruments; i.e. the NCE and the business garden.

In *Sweden* we have scrutinised the *Vinnväxt*-project "Triple Steelix in Bergslagen". This, very process-orientated programme began in 2002 and thus far two calls have been launched. The themes of the programme are regional innovation, clustering and international competitiveness. The overall objective of the programme is to achieve regional growth through dynamic innovation systems. The instrument belongs to the innovation policy field with regional dimensions. The selection of a *Vinnväxt* project is again based on the competitive approach. Involved actors correspond to the 'triple helix' concept. Funding is provided for 10 years and comes from state, but there is also a demand for regional and local co-financing. The regional dimension is highlighted in the sense that there needs to be a strategic idea in a functional region which is then able to form the basis for the project. In the case of 'Triple Steelix', the strategic idea here concerns the refinement of steel with the investigated Bergslagen region being a functional region that consists of several regional and local administrative units. In the case study we can thus see how the work to encourage innovation in a traditional industry as well as connecting the traditional industry to new one has developed. Here a comparison with the Centre of Expertise programme in Oulu can also be made.

Introduction

Over the last decade the emphasis on innovation in various policies has increased. The main explanation for this is that “innovation” is seen as being necessary for success in the new knowledge economy and as vital in the face of the challenges posed by the emergence of the global economy. In a European perspective the Nordic countries are solid performers when it comes to innovation. A number of indicators show that the Nordic macro region displays a rather good performance level in comparison with the core of Europe – namely the Pentagon.

In this working paper we will scrutinise this picture more thoroughly, above all we will investigate policies related to innovation. The main aim here is to investigate how regional innovation and innovation systems have been stimulated thus far by national policy processes in each of the Nordic countries. This working paper does not however claim to address questions related to the effectiveness or appropriateness of particular policies. Instead it provides a broad overview of the landscape of Nordic regional innovation policies while the *State-of-the-Policy Making* is investigated by looking more closely at how innovation policy *practice* in the Nordic countries is performed.

The study is based on already existing knowledge and experience concerning national and regional innovation policy by providing an overview and analysis of innovation policies of relevance for regional innovation systems. However, it is not easy to simply draw a line around what is innovation policy and what is not. It must then be stressed that policies in this respect are often so intertwined that it is difficult to separate them. According to the EU Commission, innovation policy has a “ubiquitous nature”. Innovation is included in various policy areas, i.e. innovation (research and development), competition, trade, and employment, regional and environmental policies etc. This implies that an interaction between policy areas is needed in order to facilitate innovation.¹ The national overviews undertaken here look at the connections and relationships between innovation policies, regionally-adjusted innovation policy, and regional policies and to some extent also rural policies. In the working paper, both the national innovation system policies and regional innovation system policies are addressed. In general, we have looked at policies implemented during the last five years up until autumn 2007.

An exploratory approach and comparative methodology have been used by performing a structured review of a selected number of studies on regional innovation systems and the policy documents related to them.

Firstly, a national scoping exercise was undertaken in order to identify the relevant policy instruments in place since the mid-1990s which sought to promote regional innovation (e.g. VINNVÄXT in Sweden; REGINN in Norway, DISKO in Denmark; Centres of Expertise in Finland). Each national report has been drafted in accordance with a specific set of guidelines (e.g. evaluation results and lessons learned in respect of innovation policies / programmes, policy recommendations and how they have been implemented, analysis of important policy documents etc.). The main selection criteria for the scrutinised material have been filtered through an analysis of the central programme descriptions and programme evaluations. In respect of the national adoption of EU policies we have looked at how they have dealt with the Lisbon Agenda. In order to chart future potential approaches to the formulation of regional innovation policy we have reviewed various national strategy papers addressing innovation policies in one way or another.

Secondly, all national overviews have been completed with the addition of a case study. The case studies were undertaken in order that we could take a closer look at the interface between national and regional innovation policies and actors at the regional, and to some extent, the local level in order to gain a better understanding of how policy is transmitted

¹ Commission of the European Communities (2003).

and transformed to regional actions. The case studies thus display concrete examples of the performance of innovation policies and the interface between the national and regional level. Through this approach we hope that it will be possible to interpret and evaluate whether any one national policy instrument seems to be better suited to a specific regional context than others and whether it is possible to conceptualize the reasons why some national instruments or conditions rather than others make it easier to adapt national innovation policy to a specific regional context. A pilot study was conducted in order to construct and test guidelines. The case studies follow the same structure but due to differences between both the investigated instruments and regions the content varies.

This introduction is followed by the national overviews outlining the national policies of importance for regional innovation systems in each of the Nordic countries. Each national report is followed by a case study. The national chapters are then followed by a cross analysis of the innovation policies presented in the national overviews and case studies including a set of conclusions that can be drawn from the results of the studies undertaken.

Governance of regional innovation policy in Denmark

The development of innovation policies in Denmark over the last decade can be connected to the DISKO-project, which ran during the period 1996-1999. In 2001 a liberal government was elected in Denmark thus heralding a new era in Danish politics and with significant policy implications. Major administrative changes, as well as new approaches in the business strategy development, were eventually to be put in place i.e. the establishment of regional 'vaekstfora', while the development of innovation policy in the context of user-driven innovation has been ongoing since the beginning of the 2000s.

Introduction

The first "innovation policy" in Denmark can be traced back to the beginning of the 1980s. The TUP (Technology Development Programme) mainly focused on the development of technical innovations, i.e. information technology. In the early 1990s the focus remained on information technology, but slowly edged towards technological infrastructure questions and the application side of ICT. In the mid 1990s, a broader approach was adopted by defining "developing areas", which included all private economic activities. The objective here was to develop policies in dialogue with industry. At the end of the 1990s, organisation and competence building in firms, a policy area connected to management was firmly established. By the turn of the century the Ministry of Industry had however begun to focus on general framework conditions rather than technology and sector specific initiatives. After the 2001 election the reorganisation of innovation policy gathered pace, and the Ministry of Science, Technology and Innovation took over responsibility for innovation. The Ministry of Industry however retained the task of creating good general conditions for private firms and for promoting entrepreneurship. In recent years the focus has been on science-based sectors and high technology research, i.e. nano-technology, information technology and biotechnology. The "knowledge-based economy" has also attracted increasing levels of interest. As such, a number of programmes have been established with a view to strengthening the connection between research and industry (part of the university reform process).²

Governance structures

Actors and programmes

The DISKO-project (*Danske Innovations System: Komparativ analyse af udfordringer, styrkepunkter og flaskehalse*) proved to be something of a milestone in the development of innovation policies in Denmark. The project began on the initiative of the Industry and Trade Development Council (*Erhvervsudviklingsrådet*) and ran during the 1996-1999 period. The aim here was to provide a comprehensive picture of the conditions nurturing and producing innovation in Danish firms. The basic results from the evaluation of the project were that the policy would focus on science-based innovations and already existing knowledge in the traditional sectors. It was also stated that innovations emerge through the contacts between individuals. The existence of as "short a distance as possible" between individuals is therefore crucial in developing the necessary networks and cooperation. Innovation is dependent on many factors; the most important for innovation policy is the need to support the interplay between education, the diffusion of knowledge, structural flexibility, innovation and

² Lindgaard Christensen J. *et al* (2005).

competitiveness, and as such then innovation should not only be seen in terms of technological development. Innovation policy shall aim to increase overall productivity. It is also stated that both the state and the private sector need to take action. Four main tasks were defined.

1. Support the growth of the science-based part and the high technology sectors of the Danish economy.
2. Support technical and organisational renewal in general in the Danish economy
3. Develop and upgrade human resources and the knowledge base in all parts of the private sector.
4. Counteract a polarisation of the labour market by identifying special measures and providing opportunities for those individuals with the least access to such opportunities to attain new competences and to continue and enhance their knowledge development.

A comprehensive strategy for policy fields of interest to innovation is also required so that individual measures do not compete or counteract each other. Some of these above-mentioned actions were subsequently addressed by the policies developed during this period of renovation at the beginning of the 2000s.

There are a great number of national and regional actors working with the development and implementation of innovation policy. As such it remains difficult to attain a complete picture of the *Danish Innovation System*. Nevertheless, it is evident that innovation policy has become a key issue on the political agenda. The emergence of globalisation is the main explanation for this development. In the Governmental Paper from June 2005 *Denmark and globalisation (Danmark og globaliseringen)* an innovative rebirth across all parts of the Danish economy and of its society more generally is stressed in order for it to be competitive in the new globalising world economy. This approach is developed in the strategy paper *Progress, innovation and cohesion. Strategy for Denmark in the Global Economy (Fremgang, fornyelse og tryghed. Strategi for Danmark i den globale økonomi)* published in April 2006. This strategy has been developed such that Denmark can keep its position as one of the wealthiest countries in the world and contains 350 specific initiatives, each of which entail extensive reforms in areas such as education, research and entrepreneurship. The proposed actions will imply “substantial improvements of the framework conditions for growth and innovation in all areas of society”. The ability to innovate is considered to be a prerequisite for maintaining Denmark’s position as one of the world’s wealthiest countries. Chapters 9 and 10 of the strategy address, “Good framework conditions for company research, development and innovation” and “Stronger competition and greater openness and transparency to strengthen innovation”. In these chapters it is stressed that the general education level must be enhanced, especially in the fields of science, engineering, ICT and health. Emphasis however remains on high-tech. Research focusing on user-driven innovation (see special programme) in small enterprises and in the public sector is also stressed. The suggested initiatives are mainly orientated towards research and technology measures. Competition in the private and public sector is considered to be an important driving force behind innovation and the importance of public-private partnership is highlighted. Special measures will be introduced to attract foreign high qualified workers.³ An important coordination forum for implementing and developing the globalisation strategy is the *Globalisation Council (Globaliseringsrådet)* founded in April 2005. The council was established to ensure broad involvement and a wide-ranging debate on globalisation. The council has 26 members, each a high level representative of the trade unions, industrial organisations, companies, the education and research community, or the Danish Government.⁴

³ Denmark in the Global Economy, <http://www.globalisering.dk/>

⁴ Denmark in the Global Economy, <http://www.globalisering.dk/page.dsp?area=2>



Figure 1: Organisational structure of policy actors and instruments

The most powerful national actor in the development of Danish innovation policy is the Ministry of Science, Technology and Innovation (Ministeriet for Videnskab, Teknologi og Udvikling). The focus of the Ministry of Economics and Business Affairs (Økonomi- og Erhvervsministeriet) and the Danish Enterprise and Construction Authority⁵ (Erhvervs- og Byggestyrelsen) is growth and economic development in general, including regional development. The desire to have a holistic view of regional development policy is highlighted on the Governmental level by the establishment of the Regional Policy Selection of Ministers (Regionalpolitisk Ministerudvalg) in spring 2005. The task of this group is to coordinate state activities related to regional policies. The Minister of Economic and Business Affairs has the chair in the group. Other ministers belonging to the group include

⁵ Previously called the National Agency for Enterprise and Construction in English

the Minister for Finance; the Minister for Education; the Minister for Science, Technology and Innovation; the Minister for Food, Agriculture and Fisheries; the Minister for the Environment and the Minister for the Interior and Health.⁶

In Denmark clear connections exist between growth policy and innovation policy. The policy document *Growth on Purpose (Vækst med Vilje)*, published in 2002, targeted the promotion of growth country-wide. The document mentions innovation as being prioritized. The document also stresses that innovation will be stimulated by improving the framework conditions for innovation. The document does not however include a specific regional approach to these issues.

There are a great number of national actors, i.e. agencies and councils working with questions of importance for innovation and regional growth. The Danish Innovation Council (Innovationsrådet) was established in October 2003. Its founders included the 'Think Tank' House of Monday Morning, the Ministry of Economics and Business Affairs, the Ministry of Science Technology and Innovation, the Danish Ministry of Education, Danfoss, FUUH, Novozymes and The Danish Bankers Association. The council is based on a, partly international, network of innovators and boasts members from all central private and public sectors of society. It is tasked with achieving a "wide ranging partnership". The main task of the council is however to identify and map Denmark's objectives and the opportunities open to it in the new global knowledge society. The Innovation Council also develops specific recommendations in respect of how new knowledge environments can be created in order to create as many jobs as possible in Denmark. The council is simply one tool in the attempt to achieve the overall goal of Denmark being "one of the world's most innovative societies in the next decade".

"The most important task of the Innovation council is to build and facilitate the partnerships and projects, which will ensure that Denmark develops into one of the world's most innovative societies, i.e. transform visions into reality". In addition there are also five Regional Innovation Councils (see below).⁷

The *Danish Council for Trade and Industry (Erhvervsråd)* was established by the Minister for Economic and Business Affairs and worked with business development policies. The aim of the Council was "to advise the Government on the future planning and development of business policies". The focus was to concentrate on strategically important themes, which were of importance for future business policy debates and prioritisations. The Council worked with the preparation and development of framework conditions designed to stimulate the growth of companies, international cooperation and trade by:

- Improving and developing the framework conditions for Danish industry in order to facilitate growth, international cooperation and trade
- Facilitating the adjustment of the business structure to modern competition, environmental matters and the development of society in general, and
- Promoting regional business development⁸
- As a result of the Danish structural reform the tasks of the Danish Erhvervsråd were transferred to *The Danish Growth Council (Danmarks Vækstråd)* in 2006.⁹

The Danish Growth Council was established based on the *Lov om erhvervsfremme (L 602)*. The task of the Danish Growth Council is to advise the Ministry of Economic and Business Affairs on future growth policy and to function as a coordinator between measures at the EU, national and regional levels. In order to strengthen the coordination of regional growth

⁶ Besvarelse af spørgsmål 21 (L 47 – Forslag til lov om erhvervsfremme) stillet af Erhvervsudvalget den 5. april 2005

⁷ Danish Innovation Council, <http://www.innovationsraadet.dk/>

⁸ National Agency for Enterprise and Construction, <http://www.naec.dk/Danishcounciltradeandindu>

⁹ National Agency for Enterprise and Construction, <http://www.ebst.dk/erhvervsraad>

policy, the Danish Enterprise and Construction Authority follows developments in the new regions. The Council will thus secure the connection between the national, the regional and EU-initiated business policy. At the regional level six permanent *Regional Growth Fora* (*Regionale vækstfora*) were established in April 2006.¹⁰

In *Lov om erhvervsfremme* (L 602) the municipalities are given an important role in developing businesses. In the same law it is stipulated that the *Regional Growth Fora* are the actors best equipped to develop business strategies. The *Regional Growth Fora* consist of a partnership between municipalities, the region, business life, the labour market actors and scientific institutions. One of the main tasks here is to develop a strategy for business development and an attached action plan. The strategy can utilise the themes, mentioned in the *Lov om erhvervsfremme* as point of departure, which include innovation, human resources, business start-ups, new technology, tourism and peripheral areas. The *Regional Growth Fora* can apply for Structural Funds or regional development funds for projects relating to these themes. Thus innovation has an important position in the strategies for business development and is closely related to the Danish Structural Funds programme.

An important tool in the development work here is the partnership agreements¹¹ between the *Regional Growth Fora* and the government (ministries). The aim of these agreements is, based on the business development strategies, to find key initiatives – both state and regional – which both parties wish to support, for instance initiatives within the innovation field, i.e. user-driven innovation.

Role and structure of the R & D system and education

In the Danish innovation system the universities and sectoral research institutes are important actors. The universities also have a role to play in their region through the ‘third task’ requirement, which implies that the universities are encouraged to work actively with the regional business community. The ongoing administrative reform process in Denmark implies that all regions will have at least one university located to their region. In a number of policy areas the overall challenge to increase the level of cooperation between universities, research institutes and companies is addressed. According to the Globalisation Strategy, the major part of the research shall be undertaken by private companies.

The establishment of the *Danish Agency for Science, Technology and Innovation* (*Forsknings- og Innovationsstyrelsen – DASTI*) in 2006, directly resulted from the administrative reform process. The Agency itself is comprised of the former Danish Research Agency and parts of the former department that dealt with research and innovation. The objective of the agenda is to promote research and innovation of a high international standard for the developmental benefit of Danish society – financially, culturally and socially. In addition, DASTI has an important role to play in achieving the overriding political goal of making Denmark a leading entrepreneurial and knowledge society with world-class educational programmes. The Agency’s activities deal with public research funding; researcher mobility; dialogue on priorities in research and technology initiatives; the regionalisation of research and innovation; the commercialisation of research; interaction between knowledge institutions and the business community; innovation policy; EU research policy, research dissemination; and improved ICT in Danish business and industry. In addition, activities relating to the

¹⁰National Agency for Enterprise and Construction,
<http://www.foranet.dk/Projekter/Igangv%C3%A6rende/Data/Danmarks%20V%C3%A6kstfora%20A5d.aspx>

¹¹

http://www.oem.dk/graphics/oem/Publikationer/Publikationer/2007/Regionale%20partnerskabsaftaler%20om%20v%C6kst%20og%20erhverv/Regionale_partnerskabsaftaler/index.htm

gathering and compilation of statistics about and the documentation of Danish research and innovation are also undertaken.¹²

The *Innovation Policy Centre (Innovationspolitisk center)* within DASTI works with tasks related to Denmark's national innovation policy, the interplay between business life and research, the Approved Technological Service Institutes (see below), commercialisation, entrepreneurship, the dissemination of research results and Denmark's participation in international research, regional innovation policy and development cooperation.

The *Council for Technology and Innovation (Rådet for Teknologi og Innovation – RTI)* is the actor responsible for enhancing cooperation in respect of innovation between the research sector and private companies, in line with the implementation of the globalisation strategy. The council has nine members. The role of the RTI is to advise on how to strengthen future growth and innovation in the business sector by initiating technology and innovation policies. The council aims at the facilitation and dissemination of knowledge between researchers, research and education centres, technological service institutes, and private companies.¹³ DASTI has, in association with RTI, initiated dialogue meetings with their stakeholders, i.e. private companies, researchers, educational institutions etc., in respect of innovation during the autumn of 2006. These meetings form the basis for the RTI's action plan and provide an input into the development of innovation policy up to 2010.¹⁴

A number of concrete measures exist to help facilitate the dialogue between the research sector and private companies. The establishment of *Innovation Incubators (Innovationsmiljøer)* was outlined in the document *Taet på erhvervspolitikken. Regional Erhvervspolitisk Redegørelse* reg. 21, in 2001. The aim of this governmental initiative was that these incubators would help to connect together research institutes, the business sector and investors. The task here is to help researchers to evaluate the commercial potential of an idea. The incubators offer knowledge, counselling and start-up capital in the first phase of the development of an idea. The incubator can also be active in the second phase by assisting in the attraction of capital and in assisting in the marketing of an idea the intention being to create a comprehensive infrastructure for the transference of knowledge and technology. One of the aims here is to support the commercialisation work within research institutions, by i.e., helping with patents and licences. Eight incubators have already been established.¹⁵

Innovation consortia (Innovationskonsortier) are used by companies, research institutes and technological service institutes to develop a technological platform, which will constitute the basis for the future development of products and services produced by Danish companies. The consortia look at concrete development needs within the Danish business sector. The results should however be general so that they can be disseminated to, and used by, other Danish companies.¹⁶

In Denmark there are seven *Approved Technological Service Institutes (GTS – Godkendte teknologiske serviceinstitutter)*. These GTS are organised as private companies. The aim of these GTS bodies is to collect and develop technological competence and to disseminate this knowledge to the Danish business sector. The goal is to increase the level of innovation activity within Danish-based companies. These bodies also participate in innovation consortia.¹⁷

¹² Danish Agency for Science, Technology and Innovation, http://forsk.dk/portal/page/pr04/FIST/FORSIDE/DIVERSE_SIDER/DANISH_RESEARCH_AGENCY

¹³ <http://myndigheder.danmark.dk/myndighed.asp?page=orgenh&objno=112730071>

¹⁴ Innovation Danmark, <http://www.innovationdanmark.nu>

¹⁵ Ministry of Science, Technology and Innovation, http://vidensamarbejde.dk/portal/page?_pageid=39,62512&_dad=portal&_schema=PORTAL

¹⁶ Ministry of Science, Technology and Innovation, http://vidensamarbejde.dk/portal/page?_pageid=39,62498&_dad=portal&_schema=PORTAL.

¹⁷ Ministry of Science, Technology and Innovation, http://vidensamarbejde.dk/portal/page?_pageid=39,62505&_dad=portal&_schema=PORTAL

The *IKT-korridoren* measure aims at stimulating concrete cooperation in respect of research and development within the information and communication technology (ICT) sector. The IKT-korridor will contribute to the dissemination and utilisation of existing knowledge and will be developed within ICT knowledge environments by establishing cross-regional development and dissemination projects between enterprises, science institutions and local education institutions.¹⁸

Højteknologifonden were established to stimulate research and innovation within technology fields where special Danish pre-conditions and potentials exist. Money is allocated from them to research projects.¹⁹ The *High-technological network* (*Højteknologiske netværk*) is a framework for partnerships between companies and research institutes. The aim of the network is to facilitate meetings between companies and research institutes in order to develop and disseminate evidence-based solutions to high-technology problems. The programme existed during the period 2004-2007.²⁰

Cooperation at different levels

In Denmark cooperation is widely practiced, at least rhetorically, between different levels and different stakeholders, i. e. public and private actors. Some of the examples mentioned below can moreover be viewed as one way of fulfilling the desire expressed in the DISKO evaluation to maintain the minimum “distance” between individuals in order to better develop the networks and cooperation that is necessary for innovation to flourish.

The Danish Innovation Council is an example of a broad partnership with members from both government ministries and private companies. In addition, the *Innovation Incubator* (*Innovationsmiljøer*) is a forum, which aims to connect research institutes, the business sector and investors in order to commercialise research results and ideas.

The desire to strive for a broad partnership is also visible at the regional level in the context of the six *Regional Growth Fora* (*Regionale vækstfora*) established in April 2006.

The coordination aspiration within the Government is displayed by the Regional Policy Selection of Ministries (*Regionalpolitisk Ministerudvalg*). The task of this group is to coordinate state activities related to regional policies. The Minister of Economic and Business Affairs is the chairman of this group.

Another coordination and cooperation forum of note here is the Globalisation Council founded in 2005. This Council consists of high level representatives of trade unions, industrial organisations, companies, the education and research community, and the Danish Government.²¹

Other examples of cooperation between different levels and actors are highlighted by the Regional Growth Environments, Regional Technology Centres, the *IKT-kompetencecentre* and the high-technology networks.

Focus of innovation policy

Subject

As stated in the introduction, the focus of previous innovation policies was squarely on technology and this remains the prime focus of the current policy. Notwithstanding this however policy development is undoubtedly moving towards a broader approach. In the strategy paper *The Danish Strategy, Denmark's opportunities in the global knowledge society* (Den

¹⁸ Danish Agency for Science, Technology and Innovation

http://danmark.dk/portal/page/pr04/FIST/FORSIDE/DIVERSE_SIDER/OM_FORSKNINGSS_TYRELSEN

¹⁹ Højteknologifonden, <http://www.hoejteknologifonden.dk/index.php?id=4>

²⁰ Ministry of Science, Technology and Innovation, http://vidensamarbejde.dk/portal/page?_pageid=39,62667&_dad=portal&_schema=PORTAL

²¹ Denmark in the Global Economy, <http://www.globalisering.dk/page.dsp?area=2>

danske strategi. Danmarks muligheder i det globale videnssamfund) published by the Innovation Council in 2004, social and human innovations are now also addressed.

In the Globalisation strategy the focus remains, for the most part, on high-tech. However, the programme *User-driven Innovation (Brugerdreven innovation)* provides a good example of the change of focus as regards innovation policy. The programme provides a way to ensure that the systemic development and distribution of knowledge in respect of user-driven innovation takes place. This initiative is one way to fulfil the objectives formulated in chapter 9 of the globalisation strategy. The main aim here is to define the future users' needs for services and products by using systematic and science-based methods from within, for instance, the cognate disciplines of anthropology and sociology. This is a means to attain a higher accuracy rate in respect of innovation work.²²

Geographical

An explicit regional approach seems to be lacking in terms of the globalisation strategy. Regional differences are however taken into account as regards national innovation policies in Denmark. The direct connections are, not surprisingly, to be found in the programmes and initiatives in respect of "general" regional policy. The initiatives have thus far been governed from the top but the establishment of the Regional Growth *Fora* will probably see a greater opportunity for regions to develop initiatives adjusted to their specific regional contexts.

In the DISKO-evaluation it is stated that Denmark is faced with the fact that the vast majority of Danish research is located in the capital region, while a major proportion of Denmark's manufacturing industry sector, the area in which global competition is stiffest, is located in other parts of the country. Another result that emerges here is that regional differences concerning innovation performance can be explained by reference to the existing knowledge-base of the region. A recommendation here was to facilitate the coordination of the education and business-development policies at the regional level. Local experiments shall also be encouraged between the education and business sectors. There is also a need for a better mechanism to be created to engender learning between regions.

One of the most important reports addressing regional differences and growth in Denmark during the period 1997-2001 is *Regionernes konkurrenceevne* from 2004. In the report the findings of the DISKO-evaluation are more or less repeated. The main regional differences can be explained by the following factors; changes in the workforce's educational level and the level of the entrepreneurship and innovation in already existing firms. High innovation activity can be explained by good framework conditions, i. e. the interplay between science institutions and the business community and accessibility to venture capital and the right competences. General regional policy shall aim at strengthening conditions in the regions and improving the framework conditions for business 'start-ups', innovation and the development of human resources. It is stressed that the regions must learn from each other. It is also stated that a region must have a certain critical mass in order to develop innovations. The peripheral regions are thus at a disadvantage in this respect. Exceptions do however exist where outlying regions have good development prospects. Some of these statements have been addressed in the recent developed policies.

The Danish Enterprise and Construction Authority has developed the regional benchmarking system into the *Regional Growth Model* which can be used to compare indicators on framework conditions and performance between the regions on education, entrepreneurship and innovation, research and development.²³ The model includes a range of indicators while ICT has been included in the model as an economic growth driver.

²² National Agency for Enterprise and Construction, http://www.ebst.dk/brugerdreven_innovation and *Brugerdreven innovation - Resultater og anbefalinger*, FORA, *Danmarks Erhvervsråds handlingsplan for brugerdriven innovation*, 2005

²³ The Danish Enterprise and Construction Authority, <http://www.ebst.dk/vaekstmodel/0/75/0>

In the early 2000s, it can clearly be seen that a couple of initiatives to strengthen research and innovation in regions with relatively low activity rate were already undertaken. The action plan *Knowledge moves out (Viden flytter ud)* from 2004 has direct regional implications for businesses in the periphery. This Action Plan addresses some of the weak points raised in the above-mentioned reports. The aim of the actions defined in the plan was to strengthen research and innovation in regions with a relatively low activity rate. The four priorities were as follows;

- To put research, technology and innovation on the regional agenda
- To develop a strong process of regional co-operation in respect of research and innovation
- To achieve a regional competence lift, and
- To increase the number of entrepreneurs in the whole country.

In all there were eight measures:

- New principles for the co-operation between the Ministry of Science and Research and the regions regarding research and innovation
- Strengthening the regional engagement of knowledge institutions
- Improved regional information dissemination regarding the possibilities of knowledge co-operation
- Regional technology centres
- Strengthening of innovation consortia
- Regional knowledge pilots
- Increased number of business PhDs
- Strengthening of innovation environments²⁴

The plan provided support for *Regional Technology Centres (Regionale teknologicentre-RTC)* (see case study) from 2006 up to a maximum of 4 years. The RTC was built on the pilot programme *Regional Growth Environments*, which started in 2001 giving a new regional focus to innovation policy. The programme was funded for 3 years. The aim was to increase the level of collaboration between companies, research and education institutions, technological service institutes and other actors around a business sector in a geographical area. During the period 2001-2002 17 growth environments were established. The environments consisted of local and regional participants and were organised as consortia. The RTC aims at strengthening regional interplay for research and innovation and at ensuring efficient knowledge transfer between the science institutions and companies located in non-metropolitan areas in order to stimulate high technology development in these regions. In all, 13 centres have been established, focusing on the business strengths in each particular region.

In addition, the establishment of *Regionale videnpiloter* has been initiated. The measure is offered to small and medium-sized enterprises in order to stimulate the employment of highly educated personnel. The aim here is to increase the number of highly educated people (*regionale videnpiloter*) employed outside metropolitan areas and strengthen the cooperation between small and medium-sized companies and science institutions.²⁵

The governmental paper *Regionalpolitisk vækstredogelse* from May 2006 connects regional policy with the globalisation strategy. It is stated here that the whole of Denmark is to be affected by the ongoing reform work. Regional actors are defined as having a crucial role in the implementation of the strategy. Examples here include the research and educational

²⁴ Ministry of Science, Technology and Innovation (2004a).

²⁵ Ministry of Science, Technology and Innovation,
http://videnflytterud.dk/portal/page/pr04/VIDEN_FLYTTER_UD/MENUPUNKT_IKKE_OFFENTLIGT/REGIONALE_VIDENPILOTER_BEGYNDER

sector and the stimulation of innovation within companies. The overall framework must however be adapted to regional needs and challenges. The regional restructuring process and the regional growth *fora* are seen as the means to reach the objectives. A section in chapter 5 addresses “Innovation”. Here it is stressed that the majority of Denmark’s research and development activities are situated in the metropolitan areas. Significant potential however exists for product development and process innovation in all regions. The interplay between companies and other actors, mainly regional research institutions, is defined as a key factor in being ‘innovative’.

In addition to the measures outlined above a number of national actors have regional obligations to fulfil or have a regional establishment. The Danish Council for Trade and Industry has the aim of promoting regional business development. DASTI also applies a regional approach, since one of its tasks is to work for the regionalisation of research and innovation. In the strategy paper *The Danish Strategy, Denmark’s opportunities in the global knowledge society* from the Innovation Council the importance of establishing strong industries and business clusters at the regional level is stressed. This is one of the reasons for establishing five Regional Innovation Councils (Nordjylland, Midtjylland, Syddanmark, Sjælland and Hovedstaden). A Regional Innovation Council is to be based on a broad partnership and is to function as a cooperation forum aiming at the achievement of long and short term regional growth by acting as a “catalyst” for “new thinking” in the region concerning economic development. Also the initiative *Innovation Incubator* has a clear regional dimension and 8 incubators have been established. The incubators are based on the connection between universities and science parks. In addition, the *Approved Technological Service Institutes* have a regional dimension.

A number of regionally-based policies exist which include innovation aspects. In 2003 the *Regional Growth co-operations* projects were established by the Ministry of Economics and Business Affairs in various parts of the country. In Denmark 15 areas were designated as being peripheral. The measure aimed at strengthening business development and settlement in such pre-defined regions. Today the *Regional Growth Fora* (*Regionale vækstfora*) have taken over the work of the regional growth cooperation (see above). Six *Regional Growth Fora* (Region Nordjylland, Region Midtjylland, Region Syddanmark, Region Hovedstaden, Region Sjælland and Bornholm) were established in April 2006. One forum has been established for each region so this is, in effect, a general instrument available to all regions.²⁶

The Council for Technology and Innovation has initiated the establishment of four regional ICT-competence centres (*IKT-kompetencecentre*). These centres will actively work towards the creation and establishment of research and development cooperation between companies and ICT-knowledge institutions. Special focus will be placed on regional high performance ICT competences. The centres will disseminate and encourage the use of advanced ICT knowledge within companies, i.e. product and process innovation, especially for companies located at a distance from the major knowledge environments. The centres will be selected based on an open call.

In terms of rural policy, innovation has not, traditionally, had a major role to play, however, the establishment of the publically funded private foundation *Centre of Rural Research and Innovation* in 2001 on the initiative of the Ministry of Interior is an example of the increasing level of interest in the subject. The main research areas here include the development of sustainable rural areas and business development. In 2006, the Centre became a university department.

A concrete innovation measure set out in 2000 of particular relevance to rural areas was produced by the Ministry of Food, Agriculture and Fisheries in the form of the “Innovation Act”. This act aims at the promotion of innovation and research in small and medium-sized enterprises in the Danish food production chain through support for innovative projects.²⁷

²⁶ Kommunernes Landsforening, <http://www.kl.dk/332037/>

²⁷ Ministry of Food, Agriculture and Fisheries, <http://www.fvm.dk/Default.asp?ID=15492>

Connections with the Lisbon Agenda

The Globalisation Strategy can be seen as a direct response to the EU's Lisbon strategy. The *National Reform Programme (implementation of the Lisbon Agenda in Denmark)* from 2005 includes a complete overview of reform strategies and measures performed in order to fulfil the Lisbon strategy. Innovation is addressed in connection with how the framework for productivity improvements in the private sector shall be strengthened. The establishment of the Globalisation Council is mentioned as one means of achieving better conditions for innovation.

Future perspectives

Lindgaard claims that innovation policy is not a central policy area in Denmark. Some “experiments” have been performed, but most have not been followed up. For the foreseeable future the focus will remain on science-based innovation and technical innovation. Lindgaard states that the relative neglect of innovation in the low-tech and service sectors will, regrettably, continue for some years to come.²⁸ The focus has however shifted as a consequence of the adoption of the Globalisation strategy and in the last couple of years the money allocated to research and innovation has increased significantly. Not only technological innovation is supported, resources are also given, for instance, to the field of user-driven innovation. It remains however too early to detect the consequences of the major changes that have taken place over the last couple of years or indeed predict those in relation to the new policies that are about to be implemented.

²⁸ Lindgaard Christensen J. *et al* (2005).

Regional Technology Centre – Aluvaekst

Introduction

In the early 2000s initiatives to strengthen research and innovation in regions with relatively low activity rates were introduced in Denmark. The action plan *Knowledge moves out* from 2004 had direct regional implications for businesses in the periphery with the aim of the action being to strengthen research and innovation in regions with relatively low activity rates. In the following case study we will take a closer look at how the measure *Regional Technology Centres* (*Regionale teknologisentre-RTC*) from the action plan has been implemented in a regional context. We will note in particular how the Aluvaekst RTC, located to Region Syddanmark (see Appendix), has been integrated into the process of regional innovation development.

The role of the RTC in the Danish innovation system

Brief overview of the development of the RTC

The measure Regional Technology Centres was developed from the experiences of the “jynsk-fynske” IT programme and in particular the pilot programme *Regional Growth Environment* (*Regionale vaekstmiljoer*). The Regional Growth Environment programme was organised for the period 2001-2003 and was a new and unique concept when it was implemented as the first attempt to support the regional development process through support for the interaction between knowledge institutions and the regional business community. The aim of the Regional Growth Environments was to create novel permanent cooperation and technological transfer between companies, research and development institutions, and other relevant actors within a field that was considered to be a regional stronghold. During the first programme period 17 Growth Environments were established. In the RTC measure only minor adjustments have been made to the concept developed for the Regional Growth Environment.

For the measure *Regional Technology Centres* support is provided up to a maximum of 4 years starting from 2006. During this period the Ministry of Science will set aside some 74 million DKR for co-financing. The role of a RTC is to strengthen the regional interplay for research and innovation and to ensure that efficient knowledge transfer takes place between science institutions and companies located in non-metropolitan areas, namely, areas outside Copenhagen and Århus, in order to stimulate high technology development in these regions. By December 2006, 13 centres had been established. All centres focus on business strengths in their particular region.

<http://fist.dk/site/forside/innovation/regional-innovation/regionale-teknologisentre>

The goals of a RTC are as follows:

- To establish competence and knowledge environments that can strengthen innovation and growth within the business sectors involved, where regions outside the metropolitan areas have special strengths and development potential.
- To promote strong cooperation between companies in areas outside the metropolitan areas and research and educational institutes as well as other actors and knowledge environments of importance for the development of regional business life.

- To give the research institutes and higher educational institutions a stronger role in the regional development of the business community.

Since the measure belongs to the action plan *Knowledge Moves Out* an explicit connection with the Lisbon goals can be seen. No direct influence from other countries concerning the development of the measure however exists. In a study preceding the establishment of the RTC measure there is however an explicit reference to the Finnish “Centre of Expertise” Programme. This programme is forwarded as a successful tool in making the universities and research institutes into the driving force for the development of high technology in Finnish regions.²⁹

Governance structure of the instrument

Key actors

At the national level the Ministry of Science, Technology and Innovation, has been mainly responsible for developing the content of the RTC's. The Ministry of Science has defined five priorities which guide the design of the initiative. Some of the priorities clearly include references to which actors should be included in the cooperation. In the first principle the Ministry of Science demands that the initiative must come from the regional level and the business community must be an engaged partner. Secondly, the focus should be on strong regional competences and potentials. Thirdly, there is a demand for regional co-financing. In addition, the existence of a level of interplay with leading relevant knowledge institutions is also requested. The final principle is a request for an efficient and visible dissemination of research and knowledge to regional companies. Despite the attempt at regional anchoring it is important to encourage centres to also include companies located in other Danish regions and also to investigate various international *milieus*.

The key actor implementing the instrument within the regional innovation system is a consortium consisting of public and private actors. The Ministry of Science has rather strict criteria as to what partners should be included in the partnership. The consortium must consist of 3 science institutions (i.e. universities, research institutes, GTS-institutes, regional educational institutes (CVU and vocational training) and companies. In addition, other central partners, such as associations, and regional development actors, may also take part. The Steering Group, which has overall responsibility for the strategic guidelines and for the development of the centre, consists of partners in the consortium, companies and representatives from the regions and/or municipalities.

The primary target group of the centre is small and medium-sized companies within the focus area of the centre. Larger companies can also participate if this implies a creation of legitimacy in the group and if they have a role as a driving force in the development. The secondary target group is science institutions, technological transmitters of knowledge and regional actors working with business development, which can contribute to the development of these small and medium-sized companies.

The financing of the instrument is divided into two major parts, state co-financing and local / regional co-financing. The local/regional co-financing, i.e. from municipalities and regions, is split into a private part and a public part. Half of the local/regional co-financing must be private. The state support can, at most, constitute 60 percent of the overall budget and is allocated for 4 years. Money is allocated to the participating research institutes and cannot be given to private companies. The state part will be greater at the beginning of the centre's life and is made available in order to ensure that the centre can build a base, which will make it possible to continue with the activities without state money. To receive funding for a further two years, an evaluation is then undertaken after 2 years in order to investigate whether the goals, milestones, and success criteria have been achieved.

²⁹ Ministry of Science, Technology and Innovation (2004d).

To select an RTC a call system has been developed by the Ministry of Science with the RTC having to submit an application to receive funding. The selection process is undertaken by the Ministry and based on the quality of the application. The selection criteria are as follows:

- Geographical focus
- Focus of subject and target group
- Composition of partners
- Novelty value
- Participation of companies
- Dissemination of results
- Cooperation with local/regional authorities and interplay with other regional activities
- Economy and regional co-financing

The selection is made on the entire project application, but some of the criteria above are more important in the assessment than others, for instance the consortium of partners and the fact that documentation exists in respect of the fact that the cooperation with the business community is well established remain of the upmost importance.

No pre-determined number of centres, per region, exists. The goal here is to receive a “reasonable” geographical distribution, but the main criterion is to ensure that a high level of quality is attained for all centres. Regional authorities can be engaged in the application. However, there is no direct dialogue between the Ministry and the regions and no promises can be made in the selection process.

In 2006, 25 applications were submitted. Many came from former growth environments as well as existing networks. But 7-8 initiatives were totally new. In all, 13 centres were established. Some of the approved applications were simply given money for 2 years, since insufficient funding existed for the full 4 year period. This condition however only concerned those RTC's that had previously belonged to the regional growth environment programme.

Connection with other national and regional innovation policy instruments

In the Danish innovation policy system a RTC functions as a mediator between knowledge institutions and companies and has a clear *niche* among the other national and regional innovation policy instruments. However, the RTC programme has some similarities with the *High-technological network*. The opinion is that the existing instruments have specific and clearly defined roles to play. The *GTS* focus on industrial research, technological central actors and counselling. The *innovation environments* address ‘start ups’. The *Regionale Viden Center* works with educational aspects. However, in future it is likely that there will be more regional initiatives since the regions have been given an increased role in terms of regional development with innovation being included here. This may imply that better coordination between measures initiated at the national and regional level is needed in order to avoid competing or contradictory policies.

The RTC measure has been directly affected by the structural reform process pushed through in Denmark during 2007. On the 1st January 2007 the then 13 Danish counties were reduced to five regions and the regions and regional growth *fora* were allocated a new role in the regional development process. The applications for the RTC call were submitted in 2006, which implies that this was done before the new regions were established. Negotiations are currently taking place between some regional *vaekstfora* and the RTC's concerning the co-financing of some of the approved RTC's.

Focus of the instrument

Components of the RTC

For the Ministry of Science the role of the RTC is to facilitate the establishment, integration and coordination of the innovation network. The main duties of the RTC include support for companies with the organisation and implementation of joint research and innovation projects, the exchange of contacts with national and international science institutions and the dissemination of knowledge. The activities of the centre relate to developing strategies, establishing networks, initiating activities which create innovation, facilitating cooperation between companies and scientific institutions, encouraging the dissemination of knowledge and, if necessary, developing education that is of relevance to these companies. The centre is also responsible for the division of labour and for ensuring that coordination is established between the centre and other relevant regional development actors and measures.

The main activities undertaken within the centre can be divided into two types, *general activities* and *development projects*. The general activities relate to the overall coordination between the partners and development of the centre. The development project focuses on strengthening the innovation and growth potential within the companies concerned, as well as strengthening the knowledge transfer between the companies and research institutes. Another major task of the RTC is to unite the relevant competences within the region and also see to it that companies are connected to relevant scientific institutions or companies outside the region.

Innovation approach

In the action plan *Knowledge moves out* the focus is on the development of competence and knowledge transfer and the goal is to stimulate knowledge and high technology transfer to the regions. No explicit definition of what is meant by innovation here however exists. In the report produced in connection with the development of the action plan a company is considered to be innovative if it develops *new products or methods of production*.³⁰

Many Danish SME's are active in traditional and/or low tech orientated sectors. The overall aim here is to make these companies more knowledge intensive. The RTC activities must not however be research heavy. The activities may be based on applied orientated innovation and the use of technology. This implies that the centres can both address low and high tech development. It is also stressed that the focus can be on combining new technology with organisational and management changes connected to the implementation of new technology.

Geographical approach

The RTC belongs to the innovation policy field but was explicitly created to facilitate knowledge transfer and innovation in regions outside the metropolitan areas. There is also a clear connection here to the regional context since the aim is to build on the already existing "regional strengths". The RTC shall focus on regional competences and positions that are of particular importance to the regional business life. In addition, the local and regional administrative units can be included as partners. However, cooperation with other national and international scientific institutions is encouraged and this is also mentioned as a means by which to increase the level of knowledge transfer within the region. In the evaluation of the application considerations are also made in respect of the need for the location of the approved centres to be reasonably well geographically distributed.

³⁰ Ministry of Science, Technology and Innovation (2004). p 9.

AluVaekst – A RTC in Region Syddanmark

Introduction to the regional context of region Syddanmark

The RTC *AluVaekst* is a continuation of the regional growth environment and was allocated money for a further 2 years funding in 2006. The centre is run by *AluCluster*, which is located to Lögumkloster in Region Syddanmark. Region Syddanmark was established on 1 January 2007 and includes 22 municipalities. Parts of Region Syddanmark are situated on the border with Germany. Industrial life within the region is rather scattered. The oil industry is of importance in Esbjerg, shipyards in Munkebo, engineering in Als, agricultural in Vejen and retailing in Kolding. Compared to the national average, more people are employed within the industrial sector here and less within the financial and public and personal services sectors. The agricultural sector also remains important.³¹

Table 1: Fact sheet about Region Syddanmark

Area	12,191 km ²
Population (2006)	1,185,840 (22% of national population)
Population change 2002-2005 Relative annual average	2.0 promille (national average 2.7 promille)
Population density	97 inhabitants/km ² (national average 126)
Population structure (2005)	
0-14	19 % (national average 19)
15-64	65 % (national average 66)
65+	16 % (national average 15)
Number of persons employed (2005)	538,230
Employment rate (2005)	75.8 % (national average 76.7%)
Unemployment rate (2005)	5.0 % (national average 4.8 %)

Source: Neubauer, J. *et al* (2007).

Many small and medium-sized companies exist within the traditional sector in this region. Acknowledged regional strengths include a strong user-driven innovation system, the developed network between companies, and the decentralised structure of the University of Syddanmark. The University of Syddanmark is the third largest university in Denmark and has branches in Odense, Kolding, Esbjerg and Sonderborg/Flensborg. In addition, a good geographical diffusion of knowledge centres exists as does a highly developed cooperation process with German science institutions on the other side of the national border. The weaknesses mentioned however include, poor public and private research funding, low restructuring ability in the companies, low IT application and low IT competence in the region's companies. Moreover, the education level is slightly below the national average.³²

The industrial base in the south-western part of Jutland has been characterised by the emergence of the production industry within the aluminium sector. Around one fourth of all employees within the production sector work within this sector. Another sector of importance here is the furniture industry.

As regards regional development, Region Syddanmark is expected to be the driving force and to help create good framework conditions for the citizens and the companies of the region. It is also noted that constructive interplay between municipalities, companies, the labour market actors and research institutions is needed. The role of the region is to develop a regional development plan (to be ready in December 2007). This plan shall, among other things, include assessments, presentations and the prioritisation of initiatives which aim at the improvement of regional and local growth conditions. One

³¹ Fakta om Region Syddanmark, <http://www.regionsyddanmark.dk/wm157175>

³² Fakta om Region Syddanmark, <http://www.regionsyddanmark.dk/wm157175>

important aspect of this development process is the regional growth forum, which consists of the representatives of regional council (regionsråd), municipalities, research institutes, private sector companies and associations. It has a crucial role in, and a direct influence on, regional economic development. The forum was established in 2006 and has developed a strategy for economic development. Parts of this strategy explicitly address innovation and the establishment of knowledge transfer (see below).

Governance structure of the instrument

Brief overview of the development of the AluVaekst RTC

AluVaekst was a part of the pilot programme *regional growth environment* 2002-2005. During this period *AluVaekst* received 2.5 Million DKR from the Ministry of Science. The county also funded the project with an additional 3.7 Million DKR. The aim of this project was to produce new knowledge in the aluminium branch by establishing and developing a dynamic partnership between companies and educational and research institutes. The activities performed focussed on the development of new educational opportunities, products and organisational modes within the aluminium industry.

The regional growth environment was based on a project run during the period 1999-2002. This project was developed as a cooperative venture between six municipalities, four leading companies, and the County of Southern Jutland, and was partly funded by EU money. In 2002 the legal basis for cooperation was changed with the creation of a foundation while a regional growth environment was established. The county played an active role in the application to become a regional growth environment.

Key actors

Today the members of the *Aluvaekst* Regional Technology Centre are:

- EUC South – Vocational Training Centre South
- Business Academy South Sønderborg
- University of Southern Denmark
- FORCE Technology – GTS/ institute
- Skive Technical School/Development Centre for Furniture and Wood
- The South Jutland Regional Business Development Centre

Lead Partner both for the application and project implementation is *AluCluster*, which is a centre focussing on the practical utilisation of aluminium. *AluCluster* was founded in 1999 and has four full-time employees as well as a number of freelance consultants. Since 2002 the company has had the legal status of a foundation. The task of *AluCluster* is to meet the need for highly qualified consultancy within the field of the practical utilisation of aluminium and the development of aluminium solutions. *AluCluster* consists of two units, the business unit and the innovation unit. The main objective of the business unit is to sell consultancy within the various competence areas like product and process development, design, material technology, corrosion, surface treatments, joining including gluing etc. The unit also offers companies adapted education. The main objective of the innovation unit is to maintain, develop and establish new workplaces within the aluminium area.³³ 200 companies working with aluminium belong to the *AluCluster* network.

Cooperation between actors

The programme demands extensive cooperation. *AluVaekst* is satisfied with the cooperation undertaken with the Ministry of Science who give the RTC a 'free hand' to decide over its activities and how to organise its work. In addition, the administration demanded from the Ministry of Science is not overly bureaucratic. At the national level *AluVaekst* has also

³³ AluCluster, <http://www.alucluster.com/english/welcome.asp>

cooperated with other regional growth environments by organising meetings and exchanging project and development ideas.

Previous cooperation efforts between the various actors within the consortium have worked well while there have been few problems in finding companies and universities or other knowledge institutions who would like to participate. *AluVaekst* works actively to extend the network at the international, national and regional levels. In the RTC application new partners were included since this was stated in the evaluation of the regional growth environment that more scientific and knowledge-based institutions were needed. The necessary new partners were not however available in the region, instead the Danish Technological University (DTU), Ålborg University and the Design school in Copenhagen were included despite the issue of geographical distance.

AluVaekst spends a significant amount of resources on international cooperation and is actively looking to increase its international cooperation effort. *AluVaekst* cooperates with the Norwegian Centre of Expertise (NCE) Raufoss. The fact that the company *Hydro* is located both in Raufoss and in the region proved to be an important factor behind the development of the cooperation process here. Currently an application to the Nordic Innovation Centre for fuller Nordic cooperation in respect of the development of an aluminium cluster between Norway, Sweden and Denmark is being prepared. A cross border project with German partners also exists. There is also hope of a continuation in the follow up programme to the Interreg-programme concerning *technology transfer* and *cluster development*. Since both areas are peripheral in their respective countries they have a lot in common. Moreover, there are plans for a Seventh Framework Programme (FP7) application together with some Danish universities and foreign partners. In the project high technology development is stressed. At the European level the strategy developed by and for the European aluminium industries is an important document in the development of and application process for the funding of new projects.

Connections between the RTC and regional/local programmes and strategies

From the *AluVaekst* point of view the cooperation undertaken with the County of Southern Jutland worked well. Thus far however cooperation with the new region has proved to be rather more difficult. In the County of Southern Jutland *AluVaekst* was the only regional growth environment, but in Region Syddanmark there are now 4 RTC, *AluVaekst*, *Offshore* (Esbjerg), *Stålcentrum* (Kolding) and *Robots, sensors and intelligent systems* (Odense). *AluVaekst* has tried to establish an association between them but given the different interests involved this has not been possible.

It is generally agreed that the structural reform process has seen a ‘politicisation’ of the process and that with the creation of a new regional agenda more actors have to be involved. The regions have become bigger and *AluVaekst* has to compete with more actors and thus has not been able to influence this agenda. *AluVaekst* is also located in a peripheral part of Region Syddanmark. Even if the region has stated, rhetorically, that it will support peripheral areas concrete measures have not been forthcoming.

In general, the regional growth forum is expected to coordinate its work with the state level, i.e. the Ministry of Science. Cooperation between *AluVaekst* and the present regional authority, the regional growth forum, is not however sufficiently well developed at present. Thus, the demand to integrate the centre into the overall process of regional development does not seem to be applicable to the *AluVaekst* case. The RTC is not explicitly mentioned in the regional development strategy from the regional growth forum. However, one of the six objectives for reaching the regional vision in 2015 is “*Viden og vækst gennem samarbejde om innovation*”. 17 initiatives have been established in order to reach the vision and some of them address innovation directly. Under the heading “Research, innovation and new technologies” three initiatives in particular are stated.

1. Strengthen the ability of and potential for companies to use new technology

2. User-driven innovation – research on user-driven innovation and prioritise projects within small and medium-sized companies
3. Network and matchmaking – increased cooperation between companies and research institutions.

Here we can see that the RTC fits under all headings. *AluVaekst* has attempted to have itself included but attempts thus far have proved unsuccessful. This is disappointing, since the RTC has achieved many successful results. In addition, the regional *vaekstforum* in Region Syddanmark has started a cluster initiative and here the opportunity to apply for funding exists. *AluVaekst* has also applied specifically as an aluminium cluster, but this was not approved, since the interest is in “new” clusters. Here, *AluVaekst* faces a problem since they have already been functioning for 6 years and therefore are considered to be an ‘established’ cluster.

From *AluVaekst*’s point of view the fear is that the regional growth forum will attempt to steer its activities by the imposition of more restrictive result contracts. This may however be a problem in respect of cluster development which cannot be steered too rigidly if it is to work.

Focus of the instrument

Development and usage of concrete components of the RTC

The general work approach used in *AluVaekst* could be characterised as innovative. The aim here is to connect the aluminium industry to other clusters and sectors, where there may be a potential use for aluminium. The work is performed in a systematic manner. In order to produce a focused development process work is carried out with one sector at a time. The process begins by the performing of a screening analysis, thereafter, growth groups are established. The first branch to be addressed was the furniture industry in Haning. Cooperation has also begun with the offshore sector in Esbjerg (Offshore Centre). Here the DTU has investigated the potential to use aluminium on i.e. oil platforms. The goal is, for instance, to see whether smaller companies are qualified enough to enter into the offshore industry production chain as i.e. sub-contractors. Here a mentor programme has been used as a tool. A new project within user-driven innovation is to investigate the possibilities of greater aluminium usage within the health sector.

Innovation approach

The work performed within the *AluVaekst* contributes both to the development of new products and new methods of production and organisation. The goal here is to attract new knowledge to the industry through “new dynamic partnerships”. The University of Syddanmark has developed – and is continuously updates – an innovation model for *AluVaekst*. This model was included in the RTC application. The first part of the model addresses technology-driven innovation and here the development and application of new technology is important. The second part of the model addresses user-driven innovation, which relates more to low tech issues.

Geographical approach

The whole idea behind *Knowledge moves out* and RTC is to diffuse knowledge to non-metropolitan regions with a low activity rate in respect of research and development. In the case of *AluVaekst* the newly developed cooperation with universities outside the region can be seen as one way to gain access to more knowledge in the region. In this respect, a shift of geographical focus can be seen. The *AluVaekst* RTC started as a local cooperation between the aluminium industry and municipalities in a peripheral part of Denmark. Even if its strength remains regional, there is now an evident ambition to become “regionally independent” and to go for cooperation at the national and international levels.

Conclusions

Even if the RTC instrument demands and encourages the participation of public actors at the regional level, the national level remains important for the initiative. The selection process is performed at the national level. Selection is based on the quality of the application and there is no dialogue between the national and regional level. The instrument can be seen to have suffered from the structural reform undertaken in Denmark throughout 2007. Since the call was launched before the establishment of the new regions, regional co-financing had to be renegotiated for some of the approved RTC's. The national level is also important since it contributes more than half of the funding for the centre. When the centre receives approval its actual activities are not 'steered' by the Ministry of Science. The centres must however produce a progress report every half year on their spending plans and activities. A mid-term evaluation is undertaken in order to check whether the work is progressing and that results are achieved. There are also yearly dialogue meetings between the Centres and the Ministry but here a more systematic approach may be necessary. In 2007, a new evaluation approach will begin and a performance tool and indicators will be developed. The issue of whether to include more project development management competence for the managers of the RTC has been discussed in this respect.

In the action plan *Knowledge moves out* a rather broad definition of innovation is used, which implies that it is possible to include many things. The investigated RTC has however developed its own innovation concept. The RTC is a special measure to encourage the diffusion of knowledge to regions lagging behind in knowledge development. The selection of the RTC does not however guarantee a "fair" geographical distribution. This is because industrial clusters in Denmark are not evenly distributed in a spatial sense while, in addition, the RTC's are located where the industrial clusters are concentrated. The initiative does however explicitly demand that the centres are based on regional strengths and anchored in the overall context of the regional development plan. The RTC investigated here has built on an industrial base deeply rooted in the area. This 'legacy' is not however mentioned explicitly in the regional strategy documents produced thus far by Region Syddanmark. The investigated RTC started in the periphery, but is now actively working with national and international actors who may be located outside the regional context.

Looking at the selection process for the last round of RTC the use of 'call' system tends to favour already existing and established networks. *AluVaekst* began as a local cooperation process funded by EU money, developed into a regional growth environment and is now an RTC. *AluVaekst* has, and is also actively looking to find, funding from other programmes, European, Nordic, national and regional. This mature process of cooperation may also imply that cooperation is expected to survive on its own. This is an aspect that *AluVaekst* has not however yet dealt with - at least not in its contacts with regional public actors. Even if the main aim is to become financially independent from public money the activities undertaken within *AluVaekst* are, at present, dependent on public funding. In order to continue this development, *AluVaekst* requests that a programme lasting longer than four years be developed, for instance a "Danish Centre of Expertise programme". In addition, easier access to venture capital is also needed. Such a long-term instrument is however difficult to develop due to current fiscal realities at the national level.

At the national level the RTC is mentioned in the action plan "InnovationDanmark 2007-2010" which includes the major activities related to innovation until 2010. During 2007-08 the *Danish Council for Technology and Innovation* will discuss the innovation network policy instruments and develop a strategy for the next steps. It remains however a challenge to ensure that a balanced mixture of continuity and dynamism exists in the networks and centres. The *High-technological network* is roughly based on the same idea as the RTC, but here there is no explicit regional approach. Whether these measures should be more integrated in the future remains to be discussed.

Governance of regional innovation policy in Finland

In its regional innovation policy Finland has focused on centres of growth. This resulted in the formation of the Centres of Expertise Programme in the mid 1990's. The emphasis here has been on the IT-sector and high-tech in general. However, other subject fields in the innovation policy sector are now becoming increasingly important. This change of emphasis is even more visible in other innovation related programmes, such as TEKES' Technology Programme. These "soft" fields are particularly important for the Regional Centre Programme that was launched in 2001 in order to widen the geographical focus of Finnish regional innovation policy.

Introduction

Over the last decade, Finland has experienced significant change in the governance of its regional development policy. Centralised regional development planning still plays a role when strategic questions are concerned, but the broadest powers have been handed to democratically elected province-level structures. This change was precipitated by both the deep economic depression of the early 1990's and a number of new policy requirements brought about by EU membership since 1995. Finnish regional development policy had however already seen steps taken in this direction as far back as the 1980's, when programme-based policy instruments were introduced. In the currently fashionable academic parlance this has seen a move from *governing* to *governance* in terms of Finnish regional development policy. The economic crisis Finland went through forced the government to take substantial measures to cope with the crisis. Fundamental changes were needed in the structure of the Finnish economy while the nascent strategy of emphasising high-tech R&D in the field of regional development policy was quickly prioritised. The starting point of the process however, which eventually led to many successful technological innovations and regional success stories, can however be traced back to the previous decade, when technological R&D was chosen as a focus of action in private companies (especially Nokia) and in governmental strategies alike.

Today, the Regional Councils of Finland and regional public-private clusters have a leading role in formulating the core of regional innovations. The current idea is that innovations should stem from local strengths (e.g. social networks, knowledge and R&D, economic capital and natural resources), but in order to enable this positive regional development to take place central government must established several programmes. In the ambit of responsibility of the Ministry of the Interior of Finland the Centres of Expertise (CoE) and the Regional Centre (RC) programmes are related to the promotion of a regional innovation system. In general, the focus of state regional innovation policy has changed from solely embracing technological innovations to encompassing a policy that acknowledges the importance of societal innovations and cultural capital.

Governance structures

Responsibility for developing regional innovation policies

The Finnish governance system in the regional innovation field can be characterised as being three-fold in nature. Firstly, a tight-knit group of central ministries have assumed a leading role in formulating regional innovation policy objectives and guidelines. These objectives are naturally bound up with the programme of the government in power, so amendments are typically added when there is a regime change. The Ministry of the Interior and the Ministry of Trade and Industry are the main state institutions taking care of regional innovation policy goal-setting, programme financing and coordination. From the beginning of 2008

these functions will be centralised in the new Ministry of Labour and Industry. However, since regional innovation policy is considered here to be an aggregate of a more traditional regional policy and of the newly evolving innovation policy the policy measures put in place by the Ministry of the Education also have to be considered as being important.

The second important group of players in the field of regional innovation is the university cities, such as Helsinki and its surrounding municipalities, and Tampere, Oulu and Turku. Together they form the core of actors in apex high-tech research clusters. Many of them compete on the international stage with similar sized or profiled cities, which means that strategic planning in relation to innovation policy has become a very important task for these cities.

The role of Regional Councils is central when considering both regional development and regional innovation policy in Finland. They have been named as the authorities responsible for the formulation of regional policy. Although, Regional Councils' expertise in regional development is located predominantly in the field of traditionally-oriented regional policy, they remain important actors in regional innovation policies as well.

Main policy tools

The main tools in Finnish regional innovation policy are, firstly, the Centres of Expertise programme and, secondly, the Regional Centre programme. The CoE programme was established in 1994, and is at present moving into its third programme period (2007-2013). CoE programme funding comes from several sources. In 2003 the EU Structural Funds covered approximately a sixth of the total financing, while one third came from the private business sector. The rest comes through state institutions (e.g. TEKES) and regional and local governments. The Centres of Expertise have had a central role in developing regional innovation policies: experimenting with new ways to fund operations and engaging more SME's in projects have been central to this success. In addition, a much stressed approach to networking has been successful bringing highly innovative people together³⁴. The CoE programme has had a significantly positive effect on regional development, particularly as it has made the regions more attractive to business and helped to develop strategic planning in the regions³⁵.

One important effect of the programme is the increasing level of knowledge and technology. However, one very noticeable development in this respect is that the readiness to use new research and development resources generated during the programme has increased. This is a very central capacity to possess. According to Valovirta *et al.* (2006, 21) the inability to transfer new R&D information into competitive products in the regional business life is one of the most crucial elements hindering regional innovation. Region can possess apex research results, but without vivid contacts between the research world and business-life innovations will not be turned into successful products.

Demands for the Regional Centre programme came after the CoE programme had been up and running for a few years. The goal of the CoE programme is to develop the larger city regions into becoming more creative and innovative entities on the international stage. Medium-sized and smaller regional centres and the more peripheral areas around these centres were seen to be the losers in terms of Finnish regional policy. That is why the Regional Centre programme was set up in 2001.³⁶

The aim here was to guarantee continuing innovative development to 34 city regions, as opposed to just 19 CoE programme centres. According to the RCP, Finland should have a viable network of provincial cities and towns. Innovations in these city regions are not necessarily related to international cutting-edge expertise, but rather to more traditional provincial social, natural, and economic strengths. As such however the larger city regions

³⁴ Sisäasiainministeriö (2003).

³⁵ Virkkala, S. & Niemi, K. (2006); Centre of Expertise Programme (2006).

³⁶ Lemola, T. (2006).

have not been very eager to develop projects under the auspices of the Regional Centre programme³⁷.

Role and structure of the R&D system

The development of an innovative research and development environment in Finland is strongly connected to the development of the national university network. The intensification of the natural link between regional universities, university cities and regional business life has become one of the central tasks of Finnish regional innovation policy. Significant public investment in the national university network, and especially in universities of technology, have given regional entrepreneurs an important capital and infrastructure base onto which it has been possible to establish successful and innovative business. Undoubtedly, the biggest and most successful Finnish companies, with *Nokia* as an obvious forerunner, have their own R&D departments in university cities, such as for example in Espoo, Oulu and Tampere. However, a crucial factor behind Finnish success stories in IT-sector innovations, for example, is strong public funding in the field of R&D.

This link between universities, regional governments and the regional business-community has been even further emphasised as the regional or so called 'third-task' policy of universities has been introduced. However, this desire to give universities a more prominent role in regional development even to the extent that they become incubators for regional business innovation is not at all new. The central role in a region's development process can be understood as a fundamental task that has always been part and parcel of the university – regional/local community interaction process. What is new is that now this role is being implicitly emphasised both in the working agendas of universities and in Finnish national regional policy formulation.³⁸

Cooperation at different levels

A key public player in R&D in Finland is VTT, the Technical Research Centre of Finland. It is one of the lead partners in formulating a national innovation strategy, which has been the responsibility of Science and Technology Council (S&TC) since 2005. In addition to VTT the other partners in S&TC are the government of Finland, the most important IT-companies of Finland, the Academy of Finland and the universities. This arrangement is interesting, since it tries to establish a stable structure around innovation policy formulation, which is based on public-private cooperation at the highest national level. The strength of such an "infrastructure" is based on its potential to address the most strategic questions, such as educational and infrastructure needs³⁹.

³⁷ Lemola, T. (2006).

³⁸ Kankaala, K. *et al.* (2004).

³⁹ Tiede- ja teknologianeuvosto (2006).

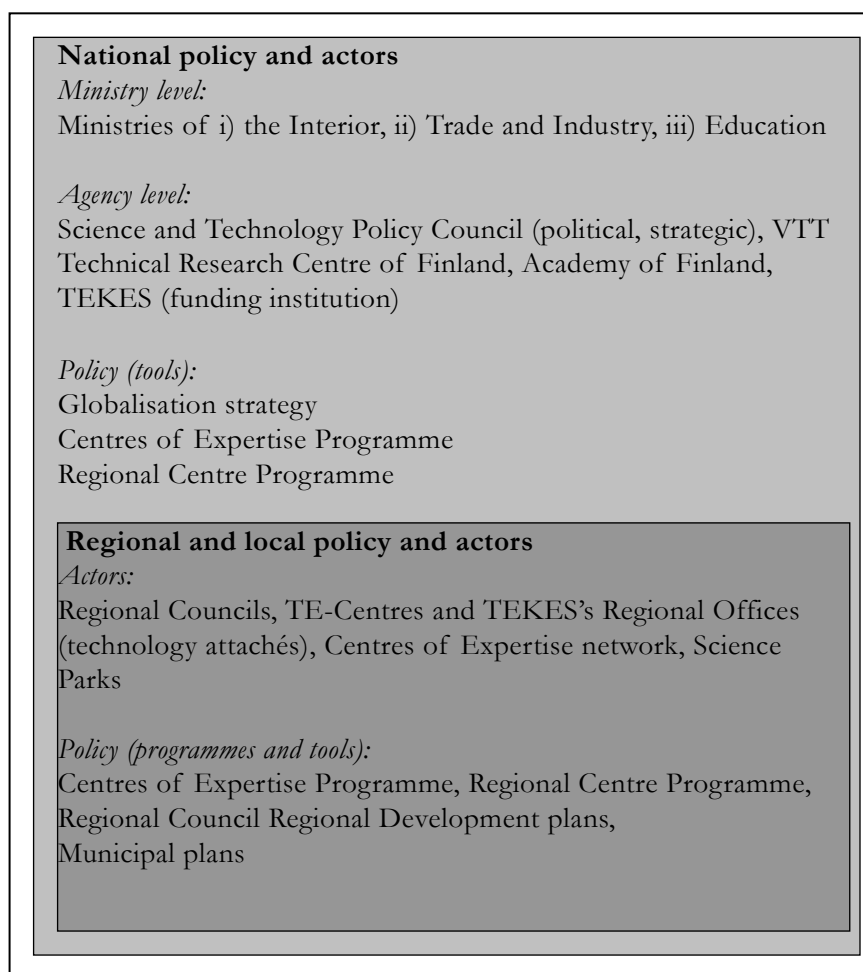


Figure 2: Organisational structure of policy actors and instruments

On the regional level the Regional Councils do play a key role in regional development policy formulation, but when it comes to regional innovation policy, regionalised state and other public institutions remain important players. For example, TE- (Employment and Economic Development) centres and regional universities and colleges are active partners in regional innovation policy formulation. Of course, this official public pursuit will not bear fruit if regional business life does not participate and is not encouraged to participate. Once again, the most advanced research findings and innovations will not turn into successful and competitive products if small and medium-sized companies in particular, on the regional level, are not able to participate in the process.

Focus of innovation policy

Subject matter

An interesting balance has been found between regional innovation policy aiming at international competitiveness and regional policy targeted at diminishing regional inequalities. In a way the two national programmes outlined above attempt to address a common problem found in regional development policies across Europe, namely, where should limited national resources be concentrated – in a few growth centres or across multiple regional centres and regions; helping the best to become even better or the worst to become more equal?

The CoE and RC programmes are different both in respect of policy orientation and geographical focus. The CoE programme aims at the encouragement of internationally competitive expertise and innovation generation, while the RC programme has focused on national level competitiveness through existing strengths on the regional level.⁴⁰

In the mid-term evaluation of the CoE programme a number of significant problems were however found to exist. Firstly, cooperation between different CoE's was lacking and international connections were based too heavily on personal contacts. In addition the existence of a significant lack of resources directed to follow up, development and internal evaluations was identified, since routine work consumed all resources. Secondly, the need to clarify the role and aims of CoE programme was also identified, since they were easily mixed up with other regional development programmes, particularly the Regional Centre programme. Conceptually, it was noted that it would be more apt to define the CoE programme as a national innovation strategy.⁴¹

The CoE programme has been successful in enhancing specialisation. Moreover, since the last evaluation (2003) the CoE programme has also been successful in promoting specialisation not only in the "hard" sphere (technology), but e.g. also in respect of adventure industries, design and environmental expertise. By the mid-term evaluation, some CoE's had however discovered problems in respect of profiling and effectiveness. For example, those promoting the adventure industries sector in Kuhmo and Lapland have not been so effective, though this probably has more to do with the subordinate role of "soft" knowledge-based focus of the programme at that time. As such then one of the major conclusions of the evaluation was that, in future the needs of the "soft" knowledge-based areas should be more fully incorporated into the objectives and practical application of the programme.⁴²

Does geography matter?

During the CoE programme it has become clear that it is efficient to concentrate on centres of growth, which means in the main, on university cities. The need for differentiation and specialization within and between regions is, in relation to regional development not only in Finland but also in other European countries, a widely held view. Nevertheless, in order to make the programme more efficient it is better to focus on existing centres and fields of expertise than to widen the thematic or geographical focus. Thus the CoE programme has concentrated on centralisation. However, regional policy-goals promoted by and through the medium of the EU structural funds process are quite different to those of the CoE programme. The structural funds are not however so easily utilised to promote centralisation. This has seen the strengthening of existing social and economic structures, rather than precipitating the formation of new and innovative ones.⁴³

On the other hand, the RC programme highlights the importance of not only technological and economic expertise, but also social and cultural expertise. This is strongly connected to the fact that the RC programme's geographical coverage has been defined by the municipalities in the RCP regions, and thus also includes municipalities with a more traditional economic base as well as those that are not so technologically oriented towards future visions. It is clear that a programme with such a regional composition will put more weight on social capital and cultural expertise, for example, than hi-tech development. The rationale behind this choice is the assumption that in the new economy business services expertise and not only technological innovations will be of central importance.⁴⁴

⁴⁰ Lemola, T. (2006).

⁴¹ Sisäasiainministeriö (2003).

⁴² Lemola, T. (2006).

⁴³ Lemola, T. (2006).

⁴⁴ Kavonius, V. & Laiho, U-M. (2005).

The RC programme's geographical focus will broaden in the coming programme period 2007-2010, since previous CoE programme centres will be annexed to the programme. Indeed, in the case of the "downgraded" CoE centres only the source of national funding for innovation promotion will change. As such, the same or similar innovation projects in the centres will be promoted through the Regional Centre programme. This way all Finnish regional centres and their functional areas of influence will have a contact point with innovation policy. This way only the most peripheral areas and municipalities in the Finnish countryside will fall outside the nationally governed regional innovation policy.⁴⁵

However, even the most peripheral communities and their actors can be part of a Centre of Expertise. The aim of a process of national level networking is to find those actors who can fill the gaps or "missing links" in the CoE network web, so that resources and development findings can be linked to the right actors.

When it comes to the connection between rural development policy and regional innovation policy, the national Rural Policy Committee has been given the task of trying to bind these fields together. This work has however, thus far at least, proved to be very difficult, since Finnish innovation policy has historically been directed to the high-tech branches of the economy, to larger urban areas and especially to university city-regions. The Rural Policy Programme for 2005-2008 includes knowledge building, specialisation and networking within its ascribed tools, something which could tie peripheral rural areas more closely to attempts to provide for the positive innovative development of these types of regions. This programme tries to increase the ability of entrepreneurs in peripheral regions to use the success of regional technological universities and colleges in the field of R&D and to form networks with them. This networking task is backed up by regional TE-Centres, which means also that this national institution needs to update its skills in the field of technological 'know-how' – at least to the extent that they know what the core strengths of the region are in this respect.⁴⁶

Nordic and European influences

Finland as a role model in regional innovation policy

Reference to the Finnish experience in the field of regional innovation policy has become 'required reading' in many instances. Some might speculate that the Finnish success story is a consequence of the specific political and economic circumstances in which Finland was placed during the first years of the 1990's. Heavy dependence on Soviet trade and its succeeding collapse forced Finland to take radical policy steps in order to battle skyrocketing unemployment. A Focus on research and development in the field of technology and a new concentration on finding new markets in the West for Finnish products thus became a high priority.

Eventually, after the middle of 1990's a new Finnish innovation policy began to emerge. The resulting CoE programme has been successful and it has been copied in the other Nordic countries, especially in Norway, but also in Sweden, though in a modified manner.

Due to this pioneering role in the development of Finnish innovation policy the further development of the CoE programme remains a very challenging issue, particularly as decisions are increasingly now taken at the inter- or transnational level. The original impetus given by technology-oriented innovation creation (e.g. Oulu Technology village) has to be renewed the need to find the right approach to this will however provide a significant future challenge.

⁴⁵ Kavonius, V. & Laiho, U-M. (2005).

⁴⁶ Virkkala, S. & Niemi, K. (2006).

Connections with the Lisbon Agenda

The Lisbon Agenda was formulated in order to grasp the central problem facing the competitiveness of EU countries in the newly emerging global economy. The globalisation strategy formulated by the Finnish government in 2005 significantly tries to bind together national efforts in innovation policy with the need for greater competitiveness in a globalising economy. This strategy has underlined the importance of regional innovation concentration and of the need for greater competitiveness. For this reason the objectives of the national globalisation strategy will be firmly anchored in the regions and to the CoE programme.

According to the Ministry of the Interior⁴⁷ and in accordance with the objectives of the globalisation strategy there is a need to form one or two science and technology-based apex units (innovation centres) in Finland in order to sustain and promote globally important innovation centres. This is possible only through strong support from local and regional level public actors and continuing close cooperation between the business community and the public sector.

In concrete terms this is possible, for example, if the recommendations of an evaluation of the Academy of Finland's research policy innovativeness are followed. There is a strong desire "to establish a forum located between the Academy and the Science and Technology Policy Council of Finland (involving university rectors and research institute directors) to help strengthen horizontal connectivity with other participants in the innovation system who have a need for high quality research".⁴⁸

Future perspectives

Learning from evaluations: the future of the Centres of Expertise programme

The new CoE-programme period 2007-2013 will focus more on enhancing specialisation and the division of labour between regions. However, specialisation should still be based on the strengths of the regional 'know-how' cluster. The new programme will also utilise more thoroughly those now dispersed national knowledge resources. More weight is also to be placed on national level networking, which should include not only apex research and technological 'know-how', but also take into consideration other fields of 'know-how', for example, business expertise and design.⁴⁹

The new national CoE programme (2007-2013) is built on the basis of 13 knowledge clusters which are executed by 21 CoEs. The idea is that business relations and innovative partnerships would grow in and between these intra-regional clusters. Each cluster consists of 4 to 7 Centres of Expertise.

This policy emphasis provides the future CoE programme with a clear remit to continue to concentrate on technological innovation, despite the fact that greater weight was given to "soft" innovations in the earlier programme evaluations and even in the wording of the new programme objectives itself⁵⁰. The "China phenomenon" i.e. representing the flight of Finnish and international high-tech companies (from Finland) to the Far East has alarmed Finnish politicians and authorities alike. In terms of science-based global technological expertise the crucial question here is whether it remains possible to form clusters that are large enough, gaining a "critical mass", such that international competitiveness can be guaranteed?

⁴⁷ Kavonius, V. & Laiho, U-M. (2005).

⁴⁸ Gibbons, M. *et al.* (2004).

⁴⁹ CoE Working Group (2005).

⁵⁰ CoE Working Group (2005).

In Finland's future national innovation strategy, expertise and innovations play an increasingly important role. The task of the national innovation strategy is to create the preconditions for a broad-based innovation policy to be developed across Finnish society, to ensure international competitiveness for the innovation environment, and to promote the creation and introduction of further innovations. The Ministry of Trade and Industry is responsible for the preparation of the national innovation strategy to be drawn up in accordance with the programme of Prime Minister Matti Vanhanen's current Cabinet. The preparation of the strategy is based on the views of citizens, enterprises and the actors themselves within the innovation system.⁵¹

Reflections

Departing from previous programme goal-setting it seems that in the new programme period the state authorities will define much more closely which globally competitive strengths the regions and clusters should concentrate on. It has been stated that Finnish regions should concentrate on a smaller number of expertise fields than was previously the case. This is put into practice by concentrating funding and giving a focal position in cooperation only to one cutting-edge centre of expertise. Other CoE's will then form "a lower level" network within the apex centre. The regionalisation of state innovation policy has thus taken a new direction. However, this choice could see that regional strengths do not play such a central role in innovation policy goal-setting as they perhaps once did. As such, the fields of expertise that are deemed to be globally competitive will predominantly be chosen by state agencies, which, paradoxically, makes the CoE programme seem ever more non-spatial and counter-regional in character.

Seen from a traditional regional development perspective this can mean that regional innovation policy is on its way towards enhancing the growth of only few centres. On the other hand, this can also work as a concept in respect of how to enhance the innovativeness and development of those centres of expertise that are not doing exceptionally well. Large scale networking around a few key expertise fields can also get those centres that fall out of the CoE programme (mainly RC programme centres) involved in a globally competitive business environment.

Learning from evaluations: the future of the Regional Centre programme 2007-2010

For the current period 2007-2010 the main or meta-objectives of the RC programme are identical with those of the CoE programme, namely, to increase social capital in order to strengthen competitiveness. As in the CoE programme the objective here is also to develop strategic thinking and foster governance based on public-private partnerships and cooperation between different levels of administration. However, the networking strategy is different. The focus in the RCP is on national competitiveness and the formation of regional innovation environments.⁵²

A key future question in terms of the Regional Centre programme remains how to govern regional networks in such a manner that the human capital potential in small and medium-sized city regions could be effectively utilised in Finnish innovation policy more generally. This task has been set for the programme in the period 2007-2010. Inter-regional cooperation and networking, which are stressed even more in this programme than in the CoE programme, have thus gained a central role. The reason for this is clear. In the RC programme the extra impetus in respect of development and social welfare is thought to come through social or cultural capital while in the CoE programme the need for competitiveness will be addressed through focusing and apex research.

⁵¹ National Innovation Strategy, <http://www.innovaatiostrategia.fi/en/overview>.

⁵² Kavonius, V. & U.-M. Laiho (2005).

However, attempting to buttress the division of labour between the CoE and RC programmes, perhaps in an attempt to distinguish between global and national competitiveness is not easy. Moreover, as noted previously, in the current period a number of the RC programme regions and centres are former CoE centres, which have been jettisoned from the renewed, geographically and content-wise more focused CoE programme 2007-2013. This new division of labour can, however, work as a good tool to increase weaker RC programme regions through networking with both former and actual centres of expertise.

In the future, where funding for only a few Centres of Expertise will be available the encouragement of networking between the CoE's and the Regional Centres will be vital if the problem of an overly narrow geographical focusing of innovation policy is to be avoided.

Bottom-up Initiatives in Finnish Regional Innovation Policy – The Oulu region and the Centres of Expertise programme

Introduction – Oulu as the home of the CoE programme

Oulu has acted as a trailblazer in regional innovation policy for many years while the actors in the Oulu Region have continued to set the agenda for Finnish regional innovation policy over the past decade. Ideas initially developed in Oulu were more or less duplicated and taken into use in the context of a national regional innovation policy instrument – the Centres of Expertise (CoE) Programme. During the previous Centres of Expertise programme period, 2003-2006, the Oulu region CoE programme concentrated on ICT (Information and Communications Technology) and the so-called well-being industries sector. The latter consists of medical, bio and environmental technology. The aim of the Oulu CoE programme has been to make the region internationally recognised and globally competitive in each of these sectors. This work will continue during the new CoE programme period, based on the national CoE cluster network.⁵³

The Oulu CoE programme has been constructed in order to benefit regional enterprises while the guiding principle of the programme remains that projects carried out under its name are of interest to companies in the private sector. This central goal has led the Oulu CoE programme to work in a very practical, but still strategically oriented way in regional CoE Forums. The work undertaken in the seven different CoE Forums in the Oulu region provides us with a well-functioning method of how to bring regional R&D institutions and enterprises together to work in a strategic manner.⁵⁴

The state funded and initiated CoE programme has also produced a number of other instruments with a view to promoting similar goals to those of the CoE programme. The Oulu Growth Agreement is a strategic action agreement where all major regional actors have engaged themselves in a common goal-setting process while also committing themselves to carrying out the objectives stated in the agreement. The Oulu CoE programme has also expanded its sphere of activities and influence beyond the borders of Oulu (Pohjois-Pohjanmaa) region by developing the *Multipolis* network concept which comprises the whole of Northern Finland, and, ultimately, in the final phase, actors from Northern Sweden and Norway also.⁵⁵

⁵³ Osaamiskeskusohjelma (2007).

⁵⁴ Osaamiskeskusohjelma (2007).

⁵⁵ Jauhainen, J. *et al.* (2004).

Oulu and the CoE programme – role model, model student, dissident, penitent leader...

The geographical context of the Oulu Region

The city of Oulu and the surrounding Oulu Region, in Finnish called Pohjois-Pohjanmaa (Northern Ostrobothnia) (see Appendix), have a long tradition of mercantilism and a distinguished history as a raw material trade hub. The region has, historically, also been one of the most internationally inclined regions of Finland, of which centuries old trade relations with Western Europe and a steady flow of migrants to the Americas in the beginning of the 20th century bare witness. In previous centuries the Oulu region has been known, in particular, for its tar and for the salmon trade, this is why it remains today in peoples' minds a "tar town". The tar trade declined during the second half of the 19th century to be gradually replaced by the products of the saw mills, and later, by those of the chemical wood industry which would see the city prosper further. The forestry industry also helped change the professional structure of the town and the region surrounding it as engineers and a more highly qualified workforce was now needed to fuel these booming new industries.

In Oulu, originally a city of merchants, the incoming engineers and industrial workers were joined, in 1959, by academia with the establishment of Oulu University. The establishment of the engineering department is one of the first steps taken on the path towards the creation of what is now a high tech and innovation-intensive region. Today Oulu is the sixth largest city in Finland and the largest city in Northern *Fenno-Scandia* with a population of 130 000. Of these almost 25 000 are students most studying at Oulu University.

Table 2: Fact sheet about the City of Oulu and the Oulu Region

Area: Oulu / Oulu region	455 km ² / 37 120 km ²
Inhabitants: Oulu / Oulu region	130 500 / 375 000 (2007) (2.5 % / 7.2 % of the national population)
Occupation structure in the Oulu city	Services 50%, industry 22% and sales 13%
Share of higher education: Oulu / Oulu region	34 / 30.5 % (2005)
Population density: Oulu / Oulu region	353.3 / 10.1 persons /km ² (national average 17)
Population change: Oulu / Oulu Region (in 10 years)	+ 16 % / + 5 %
Workplaces: Oulu / Oulu Region	69 399 / 151 000 (2004)
Unemployment rate: Oulu / Oulu Region	12.2 / 11.0 % (2006) (national average 8.4 %)
Gross Regional Product Total: Oulu / Oulu region	6 500 / 10 200 M€ (2005)
GRP/capita: Oulu / Oulu region	32 000 / 27 100 € (2005)

Source: www.oulu.fi, www.pohjois-pohjanmaa.fi and www.tilastokeskus.fi

Governance structures and the main actors in the Oulu CoE programme

The coordination of the Oulu CoE programme has been handed to *Oulu Innovation Ltd.*, which assumed this duty from *Technopolis Plc.* This was necessary, as *Technopolis* became a stock exchange listed enterprise at the beginning of the new millennia. The coordinating body of a regional CoE has to be a non-profit, public majority organisation⁵⁶, such as *Oulu*

⁵⁶ Kanninen, S. *et al.* (2007). p. 29.

Innovation Ltd. Oulu Innovation is owned by the city of Oulu, the Oulu regional council, Technopolis and some other important enterprises with R&D activities. The Ministry of the Interior and its department for regional development is the primary state authority coordinating and monitoring the CoE programme.

The whole CoE concept has been built on the foundation that the main actors are local / regional enterprises. This emphasis has been further prioritized in recent years. The point here is that universities, colleges, R&D institutions and public bodies (municipalities, regional council, state services and ministries) alike should work strategically with private enterprise in order to meet the goals set in the Oulu CoE programme – namely, to develop competitive businesses in and around the field of knowledge expertise.

The whole process of (Oulu) CoE planning, implementation and evaluation is undertaken first and foremost by regional actors, though a major role has also been given to the Finnish Science Park Association, which has been working with a National Knowledge Production Development project established by the state authorities (mainly the MoI). This project, among others, has sought to develop both the external and internal evaluation of regional CoEs' achievements, including the Oulu CoE programme.

During the new programme period (2007-2013), the national CoE programme has been constructed on the basis of 13 knowledge clusters. The idea here is that business relations and innovative partnerships would grow in and between these intra-regional clusters. Oulu takes part in five clusters and has a leading role in two of them: Oulu leads the ICT cluster together with Tampere and is a co-leader in the 'wellness' cluster with Kuopio. These are the same two sectors, out of five nationally chosen, which were set by The Science and Technology Policy Council of Finland in 2006.

CoE among innovation instruments in the Oulu region

Finnish national regional innovation policy however has a number of other instruments addressing regions like Oulu. For example, TEKES, VTT and some other national actors have for sometime been in the process of preparing a national innovation strategy for five leading knowledge-based sectors, with actors in the Oulu region playing a central role in implementing this strategy. In addition, the Science and Technology Policy Council of Finland (2006) has recently outlined a policy goal concerned with developing Finnish strategic clusters of apex 'know-how'. This strategic paper was produced in close cooperation with TEKES and The Academy of Finland, while the profile of Oulu region fits into two of the four sectors outlined as being 'nationally strategic'. However, it has to be borne in mind that this strategic work is not undertaken within the framework of regional innovation policy, but rather under technological R&D and its commercialisation.

Actually, in the Oulu region the CoE programme was from its inception and launch already an "outdated" instrument, a view generally expressed by some of the main actors connected with Oulu CoE. This was the case at least until the new programme period, based on intra-regional clusters, begun. This is because the whole national CoE programme has been built, more or less, on the basis of those network models and lines of work already initiated in the Oulu region as far back as in the 1980's. This is why, today, the main focus of all innovation-related work in the Oulu region, not only in the framework of the CoE programme, is on the business applications of technological innovations and not so much on technological innovations *per se*. This can clearly be seen also in crude numbers: the amount of patents sought by actors in the Oulu region has declined steadily from 2000. At the same time, despite this decreasing number in patents sought, the turnover of the Oulu ICT sector has actually increased⁵⁷.

The CoE programme in the Oulu region is thus only one of the instruments through which the objectives of very long-term development strategy can be promoted. The Oulu Region Growth Agreement is an umbrella strategy under which different tools are used, one

⁵⁷ Kanninen, S. *et al.* (2007). p.137.

of them being the national CoE programme. Other national programmes or instruments related to the objectives of the CoE in the Oulu region include the Regional Centre programme, funds gained via the EU structural funds (Objective 2 area) and, for example, projects promoted by TEKES.

Different actors, a number of whom were interviewed for this study, had quite different views about the significance and the role of the various regional innovation policy instruments in use in the Oulu region. The Regional Centre programme, which aims to address those centres outside the city of Oulu, was criticised most: it was seen by regional representatives as a programme in the main established to support bureaucracy, not to promote innovativeness.

At the same time, the Oulu CoE programme was also criticised. TEKES has its own technology-oriented programme which is strongly related to cutting-edge innovative enterprises in the Oulu region, but these programmes (CoE and TEKES led) have not been integrated, despite seemingly clear overlapping of objectives. TEKES provides funding to companies who seek it through the CoE programme, but it also retains its own separate funding scheme.

Evolution of CoE programme in the Oulu region

The first Centres of Expertise programme was launched in 1994, though the development that led to the introduction of this concrete instrument has long roots back into the 1980's. The original form of the national CoE programme is a combination of several developments on different levels and work done by different actors. Work carried out in the ministries to promote knowledge-based enterprise, mainly in the electronics industry had, by the 1980's, culminated in the work of the Board of Technology Policy. These efforts led to the establishment of Technology Parks in Finland, out of which emerged Oulu Technology Park. These changes have however to be seen in the wider context of change, and especially in relation to how regional policy was seen in a somewhat new light after the 1980s – moving from a focus on equalisation towards that of enablement.

In addition, the independent innovative ideas developed in Oulu at the beginning of the 1980's nevertheless formed a significant part of the basis for the later established of the national CoE programme. Many regional but also national actors interviewed for this study emphasised that the core ideas behind the national CoE programme were taken from the way in which Oulu's regional innovation policy was managed during this period at during the late 1980s and early 1990s.

Then again, the practices that evolved in the Oulu region, and that were later built upon by the national policy tools, had their origin in the development of California's Silicon Valley⁵⁸. The way in which these American ideas were applied to prevailing Northern Finnish circumstances was however extremely innovative. The process was not at all easy, taking into account the far more bureaucracy-centred societal model in Finland, as compared to the business-led development model in California. According to the interviewees, a similar application was begun in Sweden at that time, but did not succeed nearly as well. But then again, the actors in the Oulu region emphasise that the practice that is central to the CoE programme, namely partnerships between entrepreneurs and public (research) institutions, has behind it centuries of historical precedent and tradition in Oulu, the "tar town".

The first Oulu CoE programme (1994-1998) was very much oriented towards upgrading the knowledge base of regional ICT industries and to the establishment of firm working contacts between R&D institutions and ICT enterprises in order to promote new technology innovations. During the second CoE programme period (1999-2006) in Oulu the focus has gradually shifted away from emphasising technological innovations towards putting more weight on how to develop new business opportunities at the intersection of different business sectors, and especially in respect of the commercialisation of the current knowledge

⁵⁸ See also Lemola, T. (2006). p. 20-21.

base. During the previous phase, 2003-2006, the Oulu CoE programme retained its focus on the ICT sector, since Oulu is the leading ICT centre in Finland. The ICT sector comprises the communications, electronic and software industries, as well as content production and media. New priority was however also established under the heading of the 'wellness' sector, which consists mostly of medical, bio- and environmental technology.

During the 2007-2013 period Oulu will take part in six cluster-based CoE programmes. In the ICT and 'wellness' clusters Oulu is among the leading partners, in the other four it is a co-partner without a leadership role. The whole idea of these clusters is to concentrate state and EU innovation-related funding into a few apex sectors in the Finnish knowledge economy and to produce a critical mass in order to gain global competitiveness in the chosen fields.

Concrete tools in the Oulu CoE programme

The Oulu Centre of Expertise is geared up for concrete action. In the programme an emphasis is placed on large scale and practical projects. The projects illustrated below are those which were either named by the interviewees or those that were highly visible on the Oulu CoE webpage. *Bio-Oulu* aims to combine biotechnology, electronics and IT, whereas the *Global Software* project strives for the internationalisation of regional software businesses. Another ICT-related project is the *Octopus* project, which aims to form a development and testing environment for mobile applications and services. In the media sector one exceptional and very interesting project can be highlighted. ELVI – *Environment for Lucrative Virtual Interaction* is a project run by Oulu University. The goal here is to promote new innovations in the computer game sector. The work done in the context of the ELVI project is part of the Media Forum strategy, which aims to develop, through ELVI, an expert knowledge centre of interactive entertainment and game production in the Oulu region. Among other things, the ELVI-project offers game enterprises expert services in product development and marketing.⁵⁹

Since the driving force behind all measures in the CoE programme is the entrepreneurial perspective, one potentially effective way to deliver direct benefits to companies in the Oulu region is to get them to work strategically with each other and together with regional R&D institutions. A forum-based working method has been established in order to build effective common strategies. The seven forums represent the various focal directions of Oulu knowledge-based businesses and industries. The forums are as follows, the *Mobile Forum* for ICT, *NCEMForum* for electronics, *Software Forum* for software industries, *Media Forum* for content production and media, *Wellness Forum* for medical technology, *Bioforum* for biotechnology and *Eco Forum* for environmental technology⁶⁰.

As noted previously, the Oulu CoE programme is actually just one innovation policy tool among others, important as it may be. This means that the Oulu CoE programme fulfils similar objectives set for innovation promotion in the Oulu growth agreement, which is an action and strategy package including all central actors in the Oulu region.⁶¹

One important, yet often criticised, innovation promotion tool has been the *Multipolis* network, which is coordinated by the Oulu CoE. Via this tool the CoE programme in the Oulu region has been turned into an intra-regional and a cross border enterprise, since the *Multipolis* network extends over the whole of Northern Finland, while recently it has also been expanded to encompass Northern Sweden and Norway. More can be found on the *Multipolis* network in the chapter on the *Geographical focus of the Oulu CoE*.

Cooperation and partnerships in the Oulu CoE

The central feature of the CoE programme philosophy has been internalised in Oulu very thoroughly: the need to work in cooperation and to form partnerships with all actors in the

⁵⁹ Osaamiskeskusohjelma (2007a); Oulu Innovation (2007).

⁶⁰ Oulu Innovation (2007).

⁶¹ Osaamiskeskusohjelma (2007); Oulu kasvusopimus ... (2007).

region, while emphasising the private sector as being the most important strategic partner. Oulu, as the initiator of the CoE model, has a long tradition of engaging in public – private partnerships. Interviewees, especially those closest to the city of Oulu, saw that this partnership building tradition had resulted in a much greater willingness to take risks in the public sphere, which is often perhaps a crucial success factor in such a rapidly evolving business as ICT.

This public – private partnership-building tradition in Oulu however raises at least two questions that are of importance in a regional innovation policy framework. The first has been explicitly considered by the Oulu CoE programme, and it is related to private – private partnerships. This has been internalised as one of the most central tasks in order to promote new innovations in the interface between traditional technology sectors. This was also the surplus that the nationally administered and funded CoE programme was able to offer to Oulu region during the first programme period (1994-1999), since the promotion and importance of public – private partnerships had already been internalised within the region. Through the CoE programme the private – private contacts, cooperation and eventual partnerships grew rapidly in the Oulu region before the turn of the millennium.

The other question concerns a possible threat to (local) democracy in a decision-making culture, which is characterised by close contacts between public authorities, particularly key civil servants, and private actors. These problems can however be avoided if the public – private partnerships are overseen by local democratically elected bodies. However, it should be borne in mind that in cities with long city – industry cooperation traditions (especially where one industrial sector or enterprise dominates), such as Oulu, there is a real threat that decision making easily slips out of the control of representative democracy or that the planning process does not remain transparent⁶². This is one of the most important dimensions of regional innovation policy and one that should be as explicitly considered as the other important procedural goals mentioned above.

Substance focus in the Oulu CoE

The whole CoE approach has its origin in the promotion of technological knowledge and innovation. The first CoE programme period in Oulu witnessed a very strong emphasis on greater technological knowledge and innovations, especially in the sphere of electronics. However, it gradually became clear, both for the entrepreneurs and the CoE administrative staff in the Oulu region, that the central “bottleneck” in innovativeness was not the lack of technological expertise, but its commercialisation; namely, the whole process that takes place from the discovery of a technological innovation to the creation of a realisable business product that can compete in the global marketplace.⁶³ The most recent CoE programme period has thus been inundated with reference to such phrases as the “internationalisation of business”, “inward marketing” and “marketing knowledge”.

In Oulu the combination of technological and marketing ‘know-how’ has a good chance of being successful, though some criticisms were raised from the national level in respect of a certain reluctance on the part of the authorities in Oulu region to absorb social innovations in general. This means that in developing planning processes and learning from them the actors in Oulu region have not been to the fore. Social innovations can be understood as new procedures or ways of acting and thinking which have an effect on our way of perceiving reality – in this case, ways of acting and thinking that produce new business opportunities and forms of organisation⁶⁴. As one national actor presciently described it, “Oulu has lost its momentum”. This does not imply that innovation-related businesses are doing exceptionally badly in the Oulu region, which is the argument used by local actors (“we are doing perfectly well at the moment”). This critique is directed towards the way in which the Oulu CoE programme was governed and managed during the second programme period, particularly

⁶² Compare e.g. Flyvbjerg, B. (1998).

⁶³ Osaamiskeskusohjelma (2007).

⁶⁴ E.g. Härmäläinen, T.J. & Heiskala, R. (2004).

during the first years of the current decade. Much of the criticism attracted may however be related to particular individuals, so social networks and capital, and their key role in these small innovation environments should thus also be taken into account.

This is also related to the focus of the CoE programme in Oulu. Technological innovation and perhaps also innovations in the marketing and internationalisation have not dried up, though the public sector dimension in 'innovativeness' continues to suffer from severe drawbacks, according to various national actors; willingness to learn new ways of thinking and acting has, moreover, not surfaced as in other CoE centres. The Oulu CoE programme has however changed its substance focus over the years, although learning has not been a primary focus among local and regional actors. Nevertheless, pressure from the business world has forced Oulu CoE, among other regional CoE's, to emphasise marketing and commercialisation over pure technological development.

All in all, innovation policy is seen in Oulu, and perhaps also in the sphere of regional innovation policy in general, as being more or less related to technology and electronics, despite the newly established emphasis on social innovations. This is understandable, since growth in the Oulu region, and especially in the Oulu urban region, rests, primarily, on the shoulders of the ICT sector. The Oulu region and indeed Northern Finland as a whole nevertheless possess several strengths that are related to the more traditional sectors of the economy, for example, natural resources production, including forestry, energy production and mining. These sectors do not play a role in the Oulu CoE programme, which also indicates that the CoE as a programme is still very much a technology-oriented strategy. Due to this compartmentalised focus the actors that are mainly addressed in the Oulu CoE are researchers in R&D institutions, directors of high-tech enterprises and the innovation promotion personnel in the municipalities and at the regional council.

Geographical focus in the Oulu CoE

The CoE programme in Oulu is designed first and foremost for businesses located in the Oulu city and its urban area. This is a common trait of the whole national CoE programme, since one of the main objectives is to find points of gravity or a critical mass for globally competitive businesses. Critical mass can be produced through institutional 'thickness' (universities and other R&D institutions, private enterprises etc., on a small geographic area), so Oulu urban region has naturally gained the broadest attention in the Oulu CoE. However, the *Multipolis* network, which is part of Oulu CoE programme, has generally been seen as encompassing only one possibility to address also those areas with less institutional 'thickness' and thus areas that would not 'naturally' fall into the category of apex innovation production. Jauhiainen *et al.* (2004, 17) describe the *Multipolis* network and its objectives in relation to Oulu CoE programme in the following way:

"Multipolis is a co-operation network and activity between technology enterprises and regional developers in northern Finland. Multipolis connects 15 specialised spatial clusters (polis) of technology enterprises and expertise in northern Finland. The activities trespass several administrative, regional and functional borders in Central Ostrobothnia, Northern Savo, Northern Ostrobothnia, Kainuu and Lapland. [...] In the polis there are about 137 high technology enterprises and 116 other enterprises as clusters located mostly in technology centres. [...] Also universities and other relevant higher education units, research centres and several regional development organisations take part of the Multipolis activities. Multipolis is an example of regional innovation policy improving the initiation and development of technology-related products, enterprises and activities in northern Finland. [...] The goal of Multipolis is to maximise the utilisation of technology know-how in northern Finland and to expand the technology-related expertise and knowledge from the Oulu urban region to other areas in the north [...] and to create new jobs in the high-tech sector. This mission is demanding since compared to many regions in the world the amount of

innovative intertwined enterprises and experts, i.e. institutional ‘thickness’ is low in northern Finland, except in the Oulu urban region.”

The *Multipolis* concept is thus a concrete attempt to spread the benefits generated in the well developing Oulu urban region to the whole of Northern Finland, notwithstanding the relatively meagre funding, compared to the overall Oulu CoE programme, this network has been granted. It is perhaps a bit surprising that the initiative to develop this network came from several high-tech companies based in the Oulu urban region, and not from the national or regional authorities. It is often easy to assume that it is the public authorities who are most likely to be interested in promoting the egalitarian objectives of regional innovation policy and thus in developing tools that comprehensively address those more peripheral areas. However, high-tech enterprises in Oulu saw that, ultimately, they will face labour shortages if the resources currently available in other centres in the Finnish North are not utilised and if a sub-contractor network is not put in place. Their objective did not stem from egalitarian ideals, but rather from self-interest and the need to be more innovative and effective, which includes using all possible resources at hand. In this way apex knowledge-oriented enterprises in university and college towns in Northern Finland (Rovaniemi, Kajaani, Tornio, Raahen etc.) were activated to take a more central role in the “Oulu success story”. Although being financially a small part of the whole Oulu CoE programme, the *Multipolis* concept nevertheless provides an interesting approach to incorporating the broader region into Oulu’s *innovation policy*.

Despite the fact that the initiative to form this kind of a network came from the business community, which was short-of-labour, the *Multipolis* network does not escape criticism here. Problems arise when the borderlines of such a network are drawn by state and regional officials: which actors and enterprises should be accepted in and which should not? According to several interviewees, the main problem of the *Multipolis* network is the loose nature of the network and the lack of critical mass, which is brought up when “*even the neighbour’s lamb qualifies as a polis*”, as one interviewee described the situation. The effectiveness of *Multipolis* has been quite modest⁶⁵, which indicates that many actors in the network fall far behind what is required from a knowledge intensive, innovative partner.

In general, it has to be noted that the CoE programme as an innovation promotion tool in Oulu region has, overall, been quite well incorporated into the region’s development and growth strategies. The CoE has a recognised place among other funding instruments used in the region. The Oulu growth agreement led by the city of Oulu and the regional development strategy formulated by the Council of Oulu Region use the CoE programme as a well-functioning tool in regional innovation policy promotion. As noted previously, ‘the Oulu way of doing things’, especially the strong public – private partnership tradition, has thus far worked quite well in respect of carrying out the objectives stated in the national and regional CoE programme.

Conclusions

In general Oulu region has done well in terms of the CoE programme particularly in the ICT sector. The same cannot however be said for the well-being sector. The poorest levels of development have nevertheless been seen in the bio sector. Despite the successes experienced in apex fields, the national evaluations of the Oulu CoE programme showed that there were severe problems in the way the administrative apparatus considered the CoE programme in general. In particular, evaluative suggestions and advice were not taken seriously as local thinking often went along the lines of: “We are the best. We do not need the CoE. The old way of doing things has taken us this far, so we do not have to change.” This attitude was most clearly seen at the turn of the millennium.. However,

⁶⁵ Jauhiainen, J. *et al.* (2004).

accomplishments were decreasing at that time, which led to lower national funding for the Oulu CoE programme.

This effective attempt at “blackmail” was, ultimately, successful as actors in the Oulu region changed their conduct after this “incident”. Oulu is now doing fine in terms of the CoE’s own parameters while the social innovation requirements of CoE programme have been gradually internalised.

During the new CoE programme period, 2007-2013, Oulu region will probably have an even greater interest in the CoE programme since the new cluster-based working method provides something totally novel even for Oulu. The approach and objectives of the second CoE programme were thus not so successful in, or central to, the needs of the Oulu region. Of course, the growth in the ICT sector in Oulu has been good, and thus the absolute objectives of the CoE programme have, at least until recently, been accomplished. This does not concern those relative advantages brought about by the CoE programme, as mentioned above (particularly in relation to the general attitude, in Oulu, towards social innovations). These structural objectives were, according to the actors interviewed, most effective and useful in other medium-sized Finnish cities, such as Lahti, Rauma, Pori, Kokkola and Mikkeli where new public – private and private – private networking around apex knowledge has been the most successful.

The geographical focus of the Oulu CoE has, in the main, been the city of Oulu plus its adjacent neighbours. This is a natural consequence of the need for economics of scale – where one city has a relatively high population density, a university and an airport, it is there that most of the innovation-intensive businesses are taking root. In the framework of the Oulu CoE programme however the desire remains to spread the benefits of “the Oulu miracle” to the whole of Northern Finland, and beyond.

Governance of regional innovation policy in Iceland

Introduction

A definitive step was taken in providing a framework for an Icelandic innovation policy by the passing of legislation by the Icelandic Parliament in 2003, on the organisation of science and technology policy and the public funding of research and technological development. The legislation is composed of three separate laws:

- Law ((2/2003) on the Science and Technology Policy Council – under the Office of the Prime Minister
- Law (3/2003) on Public Support to Scientific Research – under the Ministry of Education, Science and Culture.
- Law (4/2003 amended 3/2007) on Public Support to Technology Development and Innovation in the Economy – under the Ministry of Industry and Commerce.

The Science and Technology Policy Council (SPTC) is headed by the Prime Minister of Iceland. Three other ministers have a permanent seat on the Council; the Minister of Education and Science, the Minister of Industry and Commerce and the Minister of Finance. At the discretion of the Prime Minister, two other ministers with research in their portfolios may join the Council. Fourteen other members are appointed to the Council from the research sector, the business sector, the unions, and the universities⁶⁶.

Through the ratification of this legal framework, one could claim that innovation policy has been integrated with science policy. Concurrently, national innovation policy has dominated the regional policy level with regard to innovation. This reflects the dominant position of central Government in Iceland and the existence of a weaker, more sporadic policy framework at the regional level. In the Icelandic case the governance of regional innovation policy is, therefore, a topic that is neither easily described nor easily analyzed.

Governance structures

Innovation Policy at national level

Innovation policy has at least three dimensions in the context of the national level.

- 1) The policy statement of the current state government of the Independent party and the Social democratic Alliance
- 2) Policy statement of the Science and Technology Policy Council and the framework provided by the legislation comprising the three laws on a) the Science and Technology Council, Public Support to Scientific Research and Public Support to Technology Development and Innovation in the Economy (see above). The Science and Technology Policy will be effective for a period of three year period before being reviewed by the Science and Technology Policy Council. The Policy is currently in effect is for the years 2006 – 2009.
- 3) Parliamentary resolution on a strategic regional development policy and plan for the period 2002-2005 and 2006-2009.

The legislation on the organisation of Science and Technology Policy and the accompanying policy statement of the Science and Technology Council can be viewed as the main

⁶⁶ The Icelandic Centre for Research, www.rannis.is

statement on innovation policy in Iceland. Both the legislation and the policy itself cover the broad field of science and technology development in close relation to policy discussion on higher education, research and development. A more detailed overview of the official structure and the policy content is provided in the sections *Role and structure of the R & D system* and *Focus of innovation policy* below.

Policy initiatives – regional level

Currently there is no mandatory legal requirement for the municipalities or regions of Iceland to form a specific policy or a plan for economic and/or social development⁶⁷. In this context it is important to note that unlike the other Nordic countries, Iceland's governmental structure has only two official administration levels, the state level and the municipal level. The term "region" in Iceland, therefore, does not represent an official governmental level, with associated governmental structures, an income and expenditure basis, or responsibilities. For this reason, at least in part, policy making for economic development and innovation, in a traditional sense, is fairly weak at the regional level. However, so-called growth agreements, which have been made between the state government and regional actors in selected regions, can be regarded as policy-related initiatives in this field. These agreements are based on a cluster ideology and were made parallel to the implementation of the parliamentary resolution on a regional development policy and plan for the period 2002-2005. In addition, the current regional development policy and plan for the period 2006-2009 states that similar growth agreements will be made in that period for other regions.⁶⁸ The agreements can be regarded as a form of regional planning for innovation within certain economic sectors. It should, however, be noted that not all regions have such an agreement in place.

Actors, programmes and other innovation support at the national level

The Icelandic national system for innovation policy and innovation facilitation can be regarded as quite complex, including a variety of actors. A recent report from the OECD's Directorate for Science, Technology and Industry (2006) provides a thorough overview of the key actors of the system. Various ministries have a role in innovation policy due to the fact that Iceland's R&D institutions are organised under sectoral ministries (Ministry of Fisheries, Ministry of Agriculture, Ministries of Industry and Commerce, Ministry of Health, Ministry of Environment and Ministry of Education, Science and Culture). There is also a wide array of higher education institutions (universities, business schools, etc.), strong representation from industry (company research facilities and sector federations), and a strong financial system. Iceland retains a strong entrepreneurial spirit; it is a country of 'doers'. This dynamism at the same time poses challenges to policy makers in achieving co-ordination among the different parties.⁶⁹ Several governmental organizations and governmentally-funded institutes have a role in the broad context of policy making and support services in this field. Many of these organizations run innovation-related projects and/or offer services and information to public agents, private firms, and individuals. Some of these initiatives are closely connected to the policy environment, while others are more loosely connected.⁷⁰

One organization however deserves special attention. This is *Impra* – which is the innovation and business support division of the central innovation and technological organisation; *Innovation Centre Iceland*. *Impra's* role is to assist entrepreneurs in evaluating business ideas, provide counselling on start-ups, growth, and the management of companies, and be a link in the communication chain between individuals, companies and public agencies. Experts at *Impra* also advise small and medium-sized enterprises (SMEs) on how to improve their business productivity, encourage innovation and assist in export planning, for

⁶⁷ Nordic Innovation Centre (2005).

⁶⁸ Nordic Innovation Centre (2006).

⁶⁹ OECD (2006). p. 24.

⁷⁰ Nordic Innovation Centre (2006).

example, by facilitating cooperation in R&D and technology transfer with foreign businesses.⁷¹ In the Science and Technology Policy of the Science and Technology Council, for the period 2003-2006, *Impra* was assigned the task of establishing formal cooperation between organizations that provide support for economic development in Iceland, and with linking them to the public support system for scientific research, technological development and innovation. This also applies to support organizations that have a specific rural focus. *Impra*, therefore, is assigned an important role as an intermediary agent within the Icelandic national innovation system.

In recent years *Impra* has put considerable effort into rural development projects and financial and professional support to rural SMEs. As well as being located in Reykjavík, *Impra* has offices in Akureyri in North East Iceland and in Ísafjörður in the West-fjord region of Iceland. Further branches are planned in the Westman Islands and South-East Iceland in 2008.

Some of the governmental ministries, other than those directly responsible for innovation policy are also involved in policy making or support for industry-specific innovation. As an example of this the Ministry of Fishing is responsible for the AVS-fund, which was initiated in 2003, for innovation in the fishing sector. The Ministry of Agriculture is also responsible for the Agricultural Productivity Fund (*Framleiðnisjóður landbúnaðarins*) which was founded in 1966, with the aim of improving education and innovation in agriculture and sparsely populated localities.

Finally it should be noted that the private sector also has a role in the context of the innovation policy environment. Several industry associations have included the concept of innovation in policy initiatives that are meant to lead the way into the future for that particular industry. A good example of this is the official strategy of the Icelandic Travel Industry Association (SAF) for 2004-2012, where innovation receives considerable attention.⁷² Many other industrial sectors have their own associations that have it as one of their goals to facilitate innovation within their respective industries. Examples here include the Farmers Association of Iceland, the Association of Icelandic Fisheries, and the Federation of Icelandic Fishing Vessel Owners, the Federation of Icelandic Electrical and Electronic Employers and so forth.

Actors at the regional and local level

Eight official economic development agencies operate in the regions beyond the capital. These agencies provide services to SMEs, organizations and individuals in a number of geographical areas. They are usually run as joint initiatives by the state and the municipalities within each area. However, business associations, trade unions, and other regional organizations, in some instances also take part in running these agencies⁷³. The state provides a proportion of the operational funding for each economic development agency, which is channelled through the *Development Department of the Institute of Regional Development* in Iceland, which also has an advisory and a monitoring role in the context of these agencies. In some instances the agencies are directly linked to regional associations of municipalities also acting as their offices. The agencies' role varies somewhat, but most have a primary focus on facilitating economic development and innovation through specific projects or services to firms, entrepreneurs, organizations and community groups. Usually the agencies have a wide cross-sectoral focus. The economic development agencies have in most instances taken on the role of implementing regional growth agreements and associated development initiatives.

⁷¹ Ictec (2006).

⁷² Nordic Innovation Centre (2005).

⁷³ Nordic Innovation Centre (2005).

Role and structure of the R & D system

Finnbjörnsson (2003) provides an excellent overview of the current Icelandic policy governance structures in the field of science and technology policy, and research and development. The following text is borrowed from Finnbjörnsson with his permission.

New legislation on the organization of science and technology policy and the funding of research and technological development in Iceland was enacted by Parliament (*Althing*) at the end of January, 2003. The new law took effect immediately. The legislation is composed of three separate laws:

1. Law on the Science and Technology Policy Council (nr. 2/2003) under the Office of the Prime Minister.
2. Law on Public Support to Scientific Research (nr. 3/2003) under the Ministry of Education, Science and Culture.
3. Law on Public Support to Technology Development and Innovation in the Economy (nr. 4/2003) under the Ministry of Industry and Commerce.

The new legislation replaces the earlier law on the Icelandic Research Council from 1994 which was abolished. The main features of the new laws are as follows.

A new *Science and Technology Policy Council (SPTC)* was established headed by the Prime Minister of Iceland. The Council provides for the permanent seat of three other ministers, the Minister of Education and Science, the Minister of Industry and Commerce and the Minister of Finance. Two other ministers with research in their portfolios can be added to the council at the discretion of the Prime Minister. Fourteen other members are appointed to the Council through nominations as follows:

- Four nominated by the coordinating committee of higher education institutions (representing 8 higher education establishments)
- Two nominated by the Icelandic Association of Labour.
- Two nominated by the Association of Icelandic Industries (Employers).
- One nominated by the Minister of Education and Science.
- One nominated by the Minister of Industry.
- One nominated by the Minister of Fisheries.
- One nominated by the Minister of Agriculture.
- One nominated by the Minister of Health and Social Security Affairs.
- One nominated by the Minister for the Environment.

While not stipulated in the law it is the declared intention that the nominees to the Science and Technology Policy Council shall have scientific, technical and other relevant qualifications and connections to secure the effective implementation of the Councils mission.

Out of the non-ministerial members of the SPTC the Minister of Education and Science appoints an unspecified number of people (probably 9) to the Science Board and the minister of Industry appoints an unspecified number (probably an equal number) to the Technology Board. It is intended that the membership of the two committees may be mutually overlapping (by two) to secure coordination and continuity between science, technology and innovation in the policy making process.

The mission of the SPTC is to strengthen scientific research, scientific training and technology development in the country in support of Icelandic cultural development and increased economic competitiveness. The SPTC shall issue tri-annual guidelines (declarations) for public policies on science and technology. The policy declarations shall be prepared by the Science Board and the Technology Board respectively.

The Law on Support to Scientific Research establishes the Research Fund through the fusion of the previous Science Fund and the Technology fund of the Icelandic Research Council. The Research Fund is governed by a board, whose chairman is also the chairman of the Science Board. Linked to the same board is also the Instrument Fund financed by 20% annual levies on the University Lottery net income. Similarly the Law on the Support to Technology Development and Innovation establishes a new Technology Development Fund which is governed by a board chaired by the Chairman of the Technology Board. The size of the fund will be 460 million ISK for 2006. Thus the link between policy and implementation through funding is achieved. This law also provides for the establishment of an Innovation Centre, which is to be linked to *IceTec* (Technological Institute of Iceland).

The chief responsibility for assistance in preparing policy-oriented papers is to be provided by the Ministry of Education, Science and Culture and the Ministry of Industry and Commerce for the two respective boards. Overall co-ordination is provided by the placing of a secretary within the Science and Technology Policy Council at the Ministry of Education and Science. The administrative services for the operational level of the whole structure are provided by the Icelandic Centre for Research – *RANNÍS* which is the secretariat of the previous *Icelandic Research Council*. Its mission is to provide administrative and operational support to the boards and funding bodies, to manage their international connections, monitor the effects and impacts of policies and to provide knowledge assets for and informed advice to the STPC and its boards and sub-committees. Thus *RANNÍS* will administer all the funding bodies set up by the new legislation including the Research Fund, the Technology Development Fund, the Instrument Fund, the Graduate Training Fund and other funding bodies for science that the government may want to assign to it. It will maintain the National Contact Point Coordination and support network to the EU Framework programme, the Nordic NOS – organizations and other international bodies in science and technology. Thus *RANNÍS* will function as the operational arm of the new council structure.

[The quote from Finnþjörnsson's (2003) text ends].

The Icelandic innovation policy governance structure is shown in Figure 3.

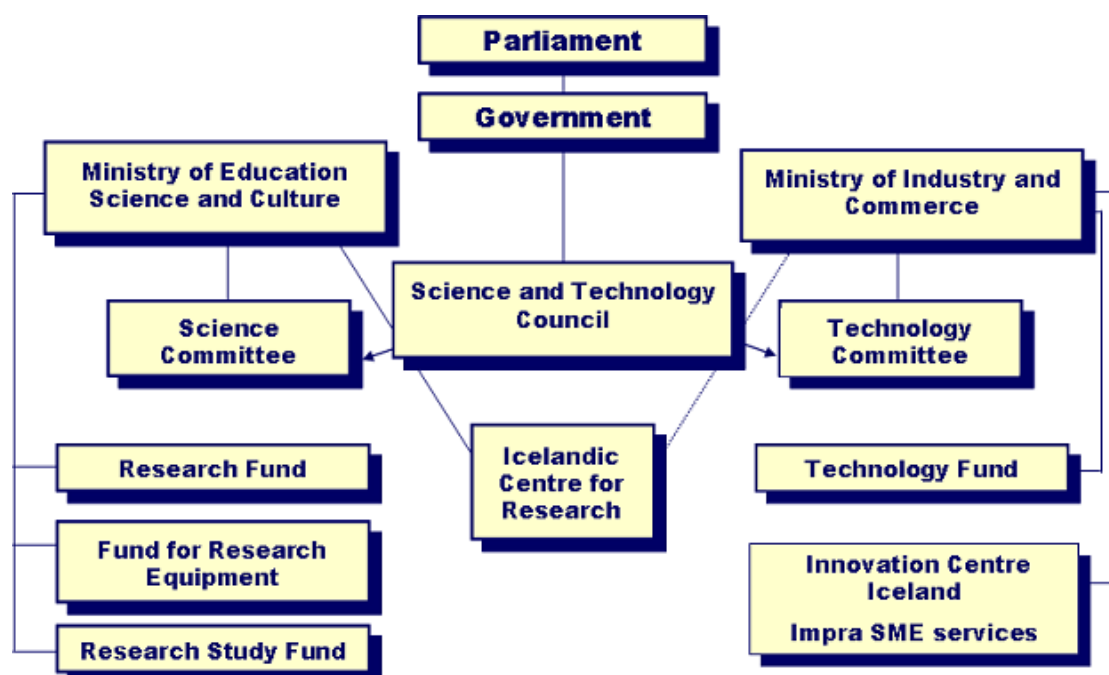


Figure 3: The governance structure for science and technology (innovation) policy and research and development, in Iceland.

Focus of innovation policy

The legislation on the organization of Science and Technology Policy and the accompanying policy statement of the Science and Technology Council is what currently comes closest to the traditional understanding of innovation policy in Iceland. In a nutshell “the policy underlines Iceland’s status in an international context and the focus is on ensuring a holistic approach and the quality of education and research carried out by institutions, firms and universities”⁷⁴. The council’s vision for the future furthermore states that “the key to success is a vision of the future and tenacious, well educated people capable of evaluating and exploiting opportunities associated with the rapidly changing social and market conditions. A coordinated effort by the government sector and the private sector is needed to elevate Iceland internationally to a forefront position in scientific and technological performance thus underpinning a competitive, rich and highly performing economy”. In order to implement the council’s vision the following strategic priorities for the period of 2006-2009 are emphasized:

- to establish an internationally outstanding educational and scientific institutional system, closely connected to a dynamic economy, capable of providing leadership in responding to rapid changes;
- to strengthen public competitive funding schemes and merge these in related areas;
- to encourage private firms and the public sector institutions to join efforts in strengthening research and development in order to boost successful and profitable innovation and thus international competitiveness based on knowledge;
- to redefine the role of the public sector in financially supporting scientific monitoring and research in support of public interest, environmental protection and sustainable economic growth.

The policy puts forward four additional chapters, each including a discussion, followed by a number of recommendations. These chapters focus on the following broad topics: 1) the development of the policy environment, including discussion on public and private expenditure on R&D and the evaluation of policy and organizational structures (titled: Coordinated efforts), 2) education at all levels from the primary level to the PhD level and increased linkages between the education system and other spheres of society (titled Education at the frontier), 3) R&D with an emphasis on applied research in humanities and social sciences, the health sector, environment studies and resource management (titled Research in the public interest) and finally 4) innovation (titled: Effective innovation – more competitive companies). The main focus of this section is on the strengthening of the ICT community and public-private partnerships, creating a favourable business environment for companies in order to foster innovation and growth and finally to develop effective tools to encourage increased business investment in RTD. The council puts forward several recommendations, including the following:

- the public support system for research, development, innovation and economic growth will be simplified and made more transparent and comprehensive also taking into account the different needs of new companies for public support.
- greater effort should be made to encourage companies to build up their knowledge base while grants will be provided to support RTD projects carried out by their employees who are enrolled in research-based tertiary education.
- innovative efforts in the service sector will be strengthened, particularly in respect of culture-based service activities, humanities and social science sectors.

⁷⁴ Science and Technology Policy Council (2007).

The focus of innovation policy in Iceland has tended to be general in orientation. As can be seen from the discussion above, overall the current policy, including its recommendations, is quite broad and in only a few instances are direct measurable indicators for key themes put forward. The policy takes the form of formal guidelines rather than a definite strategy. Channels for implementation are not formally defined. Responsibility for implementing the policy therefore lies with the various ministries and key governmental institutes⁷⁵. It should be noted that according to the Science and Technology Council's webpage, following the policy declaration the council concluded that its committees should put forward an implementation plan in order to reach the Council's strategic goals. A holistic plan of this sort, however, still remains to be put forward.

Does geography matter?

The regions of Iceland receive little attention within the current Science and Technology Policy. The only location-specific issue mentioned in the policy is an emphasis on coordinated efforts to establish a "knowledge park" in the area of Vatnsmyri in Reykjavík. Among other things this is said to improve the conditions for innovation and stimulate the exploitation of R&D. The policy states that "the establishment of a dynamic knowledge park in Vatnsmyri would benefit the country as a whole and provide a powerful backbone for regional knowledge centres".⁷⁶

The current policy does not, moreover, have clear linkages to the Parliamentary resolution on strategic regional development. Interestingly the former policy statement of the Science and Technology Policy Council (i.e. for the period 2003-2006) had a somewhat stronger focus on regional issues under a section entitled Co-operation on building up research facilities - links to regional policy. The following paragraph is found on p. 12-13 of the policy for 2003-2006:

"Regional development will probably be determined to a large extent by success with innovation in the economy and knowledge based job-creation in the rural communities of Iceland. Research units manned by competent personnel with strong initiative can have a decisive and positive impact on regional development, especially in certain areas where it is possible to harness local uniqueness. The Science and Technology Policy Council emphasises that universities and research institutes in regions outside the capital city area should continue to be enabled to carry on research and technological development in fields especially well-suited to reinforcing innovation in the local economy and business life of the respective region. In the opinion of the Science and Technology Policy Council, these endeavours should be promoted above all through the organised co-operation or linking of such rural centres to research institutes and/or universities which possess a greater breadth of knowledge and provide access to needed equipment and facilities. Regional support programmes can, in this context, play a significant role and lead to co-operation."

An evaluation of the Science and Technology Policy for 2003-2006 is currently ongoing⁷⁷. Research carried out by the University of Akureyri Research Institute for the Nordic Innovation Centre⁷⁸ indicated that, at least in some rural regions of the country, the national policy in this field has a fairly insignificant role:

"Transparency of the national cross-sectoral policy environment (including both the policy of the Science and Technology Policy Council and the rural development policy) seems to be fairly poor. Awareness of and familiarity with different policy initiatives is limited, especially among firm representatives, but also among many of the representatives of the various support organizations. "[...] We can argue that the

⁷⁵ Finnbjörnsson, T. (2007).

⁷⁶ Science and Technology Policy Council (2007). p. 6

⁷⁷ Finnbjörnsson, T. (2007).

⁷⁸ Nordic Innovation Centre (2005).

visibility and coherence of the cross-sectoral policy environment should be improved with an emphasis on reaching the attention of the so-called end users.”⁷⁹

Based on the above one conclusion may be that to fully utilize the possibilities of the new policy governance in the field of science and technology policy (innovation policy), as well as the potential of universities, research institutes and other knowledge based operations, ways have to be found to utilize these resources all over the country. Different circumstances in different regions and the needs of different industry sectors have to be accounted for.

Nordic and European influences

The present governance structure, for the field of science and technology policy in Iceland, is a result of a fairly recent reorganization process. Although various examples and lessons from a number of different countries were taken into consideration when designing the new structure, the good example of Finland, with the appropriate adaptations, can be regarded as being the most influential when looking at foreign influences on the current system⁸⁰. The broad and cross-sectoral approach to the composition of the Science and Technology Policy Council, where a broad range of ministries have an important role, is an important component of the Icelandic System. Decisions on the design of this part of the organizational structure were profoundly influenced by the Finnish experience and are, therefore, a good example of foreign influences on the system's design.

Iceland is not an EU member and does not therefore, have direct affiliation with the Lisbon Agenda. According to Baldursson (2007) and Finnbjörnsson (2007) the Lisbon Agenda, however, has influenced innovation policy, research and development as well as the overall business environment in Iceland, albeit indirectly. The European market is the most important market for Icelandic SMEs and both extensive and varied business relations between Icelandic and European parties are in place. These relations are indirectly influenced by the overarching EU framework, including the various policy and regulatory systems in operation. Icelandic governmental institutes, including *RANNÍS* – The Icelandic Centre for Research, as well as universities and other public and private organizations have also participated in various European projects that have been directly linked to European programmes or initiatives that have been initiated as part of the Lisbon agenda's implementation plan. Participation in European cooperation has resulted in various direct and indirect lessons for the associated parties in Iceland. Many of the Agenda's broad goals have also been at the forefront in Icelandic society as in other western societies, e.g. the transition to a knowledge-based economy and the building of dynamic business environment. Many of the topics touched on in the broad development scheme of the Lisbon agenda have, therefore, also been at the centre of development in Iceland.

Future perspectives

A considerable change took place in the field of innovation policy and related governance structure in the first years of the new millennium. The most important feature of these changes is that innovation policy has been integrated with science and technology policy. Since 2003, when the new legislation was passed, the Science and Technology Council forwarded two policy statements of which the first only recently has expired. The current system is, therefore, young and the evaluation of the first operational period (2003-2006) has not yet been completed. It is of great importance then that a thorough evaluation of the outcome of the recent system development and the effectiveness of the new system is quickly undertaken.

⁷⁹ Nordic Innovation Centre (2005). p. 259

⁸⁰ Finnbjörnsson, T. (2007) and Baldursson, E. (2007).

The Icelandic economy has become ever more globalised in recent years as Icelandic firms in fast developing sectors, e.g. financial service, high-tech (e.g. ITC), and retail, have entered the international market. It is likely that the participation of the Icelandic business community in international competition will continue to grow. This will increase the need for innovation as an incremental part of ensuring competitiveness. This obviously calls for a strong innovation policy, and importantly also for associated action plans and support programmes. These should, therefore, have a high future priority in Iceland.

The limited focus of the current national innovation policy on regional issues and to some extent on sector-specific issues gives rise however to some questions. Icelandic regions differ considerably in terms of knowledge infrastructure as well as in general economic structure and industry composition. The highest level of policy making for innovation facilitation has to acknowledge these differences by actively integrating actors (and the cooperation of actors) from different parts of the country. The business environment of many (rural) regions of Iceland is characterized by small firms of which the majority operate in primary industries (or related fields) or in basic services. How to increase the overall competitiveness of Icelandic businesses and institutions, including the above-mentioned rural businesses remains then an important future task for Icelandic policymakers in the field of innovation policy.

VAXEY Growth agreement for the Eyjafjörður region

Introduction

The growth agreement of Eyjafjörður (Vaxtasamningur Eyjafjarðar, VAXEY) is a project which began in 2004 and concluded on 31st December 2007. It was undertaken as a collaborative venture between private and public corporations in the Eyjafjörður area, the local municipality and the national Ministry of Industry and Commerce. Its main goal was to promote the Eyjafjörður region as an attractive place to live, increase the number of inhabitants and develop the regional economy.

The agreement was the first of its kind in Iceland and had the main goals of boosting innovation and growth in a specific region, supported both by the government and private parties. During the term of the agreement, some 400 people participated in the cluster activities, and around 100 companies and institutions sent their representatives to workshops and introductory meetings. Now at the end of the project period a number of set goals have been reached and a number of projects have been initiated. Examples of VAXEY's results include the foundation of the School for Renewable Energy Science (RES), *Molta ehf* (waste removal company) and *Starfsendurbæfing Norðurlands* (Centre for job rehabilitation of northern Iceland). Due to the positive outcome of VAXEY and actors satisfaction with it, discussions over the continuation of the agreement began early 2007.

The role of the growth agreement in the national and regional innovation system

Introduction to the regional context of Eyjafjörður region

The Eyjafjörður region is defined in the agreement as the nearest area around Eyjafjörður. The travel cluster (see below) differs from the three other clusters and goes further, and focuses on the whole area of northern Iceland. Eyjafjörður region is considered to be the most attractive living area in Iceland beyond the capital region. The region has around 24,000 inhabitants. Around 75% of the population live in the city of Akureyri the other 25% are spread across the other parts of the region, i.e. in small towns, villages or rural areas. The region's main employment sector is services, but agriculture, fish processing and food production also comprise a large part of the economy. In the smaller municipalities the main industries are fishing and agriculture. In Akureyri, which is the centre of the region, the economic diversity is greater and changes have occurred implying an economic shift from industrial production to the production of services. The expansion of the University of Akureyri has implied increased employment opportunities in the educational and research sectors. These changes are similar to those occurring in the capital area. In the investigated region 2/3 of employed people work within the service sector while in other regions of the country 2/3 of the working population are employed in the primary industry sector. Because of this, the region is, from a domestic perspective, well suited to developing a growth agreement like VAXEY, as it has the potential for innovative development and a growing research capacity as well as an already diversified economy.⁸¹

⁸¹ Klasar (2007).

Table 3: Fact sheet about the Eyjafjörður region

Area-	The area from Ólafsfjörður in the north all the way to Grenivík on the east coast of the Vaxey area, some 4100 km ²
Population (1st December 2006)	22,143
Population change 1998-2003	+3.8%
Population density	5.27
Population structure (2006)	
0-14	5,028
15-64	14,371
65+	2,744
Number of persons employed (2005)	14,836 or 67%
National employment rate (2005)	81.9%
National unemployment rate (2005)	2.1%.

Source: Statistics Iceland (2007), Neubauer, J. *et al* (2007) and Regional development (áætlun) for Eyjafjörður region 2004.

When the growth agreement was established in 2003 the inhabitants of the area numbered about 21,550 having grown by around 800 since 1998. Most of these new 800 inhabitants settled in Akureyri while total inhabitants in the surrounding areas decreased. The educational rate in 2001 showed that only 12.1 percent of the workforce in the Eyjafjörður area had a higher education while the rate for the capital was 22.9 percent⁸². Today the inhabitants of the Eyjafjörður region total some 22,000 which is about 2,500 more than 4 years ago. The service sector has increased in both size and importance in Akureyri as in Reykjavík but remains rather limited in the countryside beyond Akureyri itself⁸³.

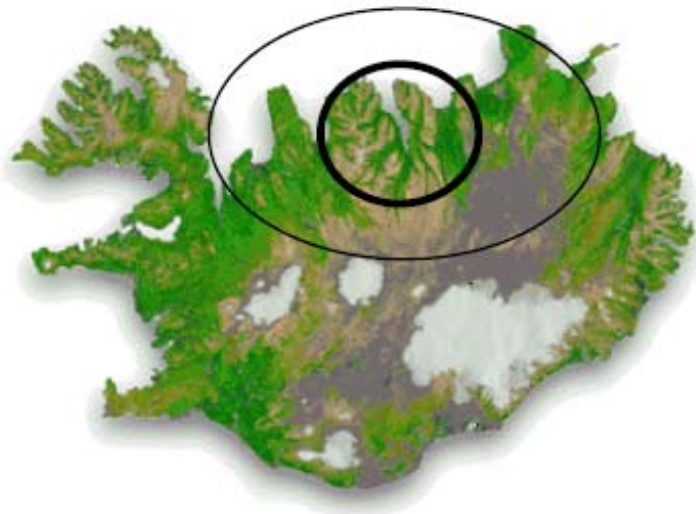


Figure 4: The smaller circle shows the Eyjafjörður region while the larger one shows the surrounding areas likely to benefit from the project. The larger area is addressed in the travel cluster.

Brief overview of the development of the growth agreement

A general trend in Iceland is that people move from rural areas to the capital area and regional centres. To prevent depopulation in the rural areas action had to be taken, and the government has thus initiated various regional policy plans. The VAXEY agreement is, however, the first project of its kind in Iceland and its role is to address the Eyjafjörður

⁸² Regional Development (áætlun) for Eyjafjörður region (2004). p. 50.

⁸³ Statistics Iceland (2007).

region and its surroundings. The VAXEY projects' main goals are to promote the region as a desirable place to live, increase the number of inhabitants and build up the regional and local economies. The strongest professions in the region should be reinforced while the number of competitive companies and qualified jobs should be increased thus enhancing the supply of products and services. This reinforcement of the region should attract international investment and knowledge while potentials created by national projects should be exploited by the cluster-based management approach and by employees across the region⁸⁴.

The VAXEY agreement is based on a cluster approach. The agreement is based on a report made by a working group established by Valgerður Sverrisdóttir, former Minister of Industry and Commerce, in May, 2002. One of the main concepts here was the desire to address the issue of the attractiveness of rural areas for settlement and to make them a viable alternative option for settlement in relation to the capital region. The assigned working group was tasked with drawing up a strategy for the Eyjafjörður region in respect of its growth and empowerment, while considering the ongoing globalisation of the economy and the issue of technological change. Representatives from the region, the Ministry of Industry, the National Institute of Regional Development and some foreign specialists evaluated the region and reported to the minister in March 2004.

VAXEY's Regional Growth Agreement has the following goals:

- Enhance the regions popularity as a place of residence
- Encourage growth in the regional population during the project period
- Increase local competitiveness and facilitate economic growth
- Develop and strengthen the area's growth sectors
- Increase the number of competitive companies and jobs, augmenting the supply of products and services
- Exploit the possibilities created by joining international projects and attract international investment and knowledge

Governance structure of the instrument

The Vaxey agreement is built upon cooperation between numerous parties; local and national as well as public and private. The parties' roles vary, from financial support to participation in meetings and strategy development. The working group, which produced the initial report upon which VAXEY is based contained local and national representatives, both from the public and private sector. The main components of the agreement, the clusters, do also consist of participants from the different parties. Therefore the VAXEY project unites different levels and actors together not only at the regional level but also at the national level.

In July 2004 the VAXEY contract was signed by following actors:

- Governmental actors
 - Ministry of Industry and Commerce
 - The Institute of Regional Development
 - *IceTec* Technological Institute of Iceland - *Impra* Innovation Centre
 - Trade council of Iceland
- Regional actors
 - Akureyri Region business agency on behalf of the municipalities around Eyjafjörður
 - University of Akureyri (UNAK)
 - KEA – *Kaupfélag Eyfirðinga Akureyri* (cooperation movement)
 - North Iceland Office of the Federation of Icelandic Industries
 - Trade unions around Eyjafjörður fjord

⁸⁴ Klasar (2007).

VAXEY's actors play different roles in the project but all contribute with financial support to the project. Each actor assigns a person to the board. In the contract the actors signed for allocations of about 1.950.000 euros. The largest budget source was the Ministry of Industry, which allocated approximately 1 million euros over the whole project period. Extra financial support came from private actors, both as capital support and as 'in-kind' contributions. Valgerður Sverrisdóttir announced actors for the agreements board and the growth agreement structure (see figure 5):

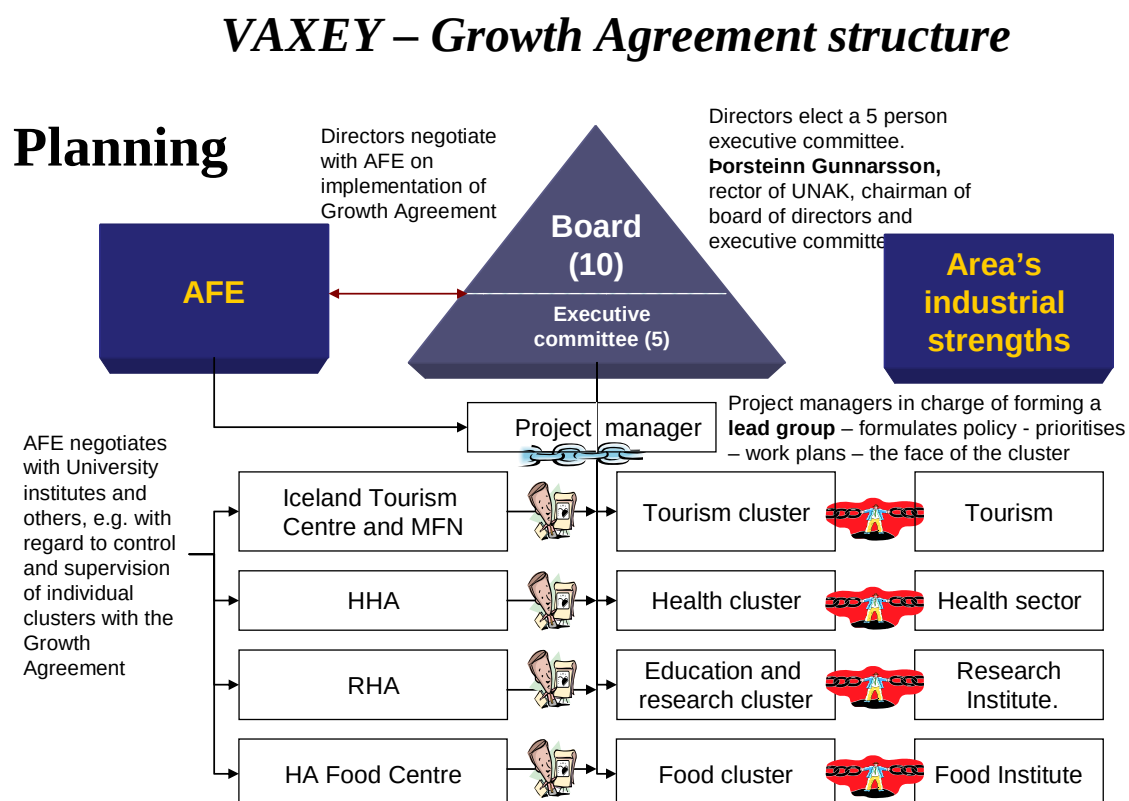


Figure 5: Vaxey Growth agreement structure

Cooperation between actors

Cooperation between the project's actors has worked smoothly over the years despite some differences in prioritization within the project. To mention one specific thing regarding conflicts of interest the project managers for the clusters all mentioned that the large financial contribution from the Ministry of Industry and Commerce had a major impact on the prioritization of projects and their main goals. However, no specific examples were mentioned.

Connection to other national and regional innovation policy instruments

The VAXEY agreement is built on the cluster ideology with inspiration taken from similar projects, i.e. in Silicon Valley in the USA, and from many regions in Italy⁸⁵. However, the main inspiration for the VAXEY agreement was the Oulu project in Finland. Here a non-profit development company, which focuses on regional economic development in technology and the high growth business sector, was established. The company's main task is to support enterprises and strengthen their competitiveness in global markets. *Oulu innovation Ltd* also promotes the attractiveness of the region, develops the operating environment of the enterprises and provides strategic leadership in developing the economic environment in the region⁸⁶. As seen from the description of Oulu, it resembles the goals and focus of the VAXEY agreement. In addition, *Oulu innovations Ltd*, like VAXEY is financed by governmental, regional and local actors. However, the structure differs somewhat. *Oulu innovation Ltd* was founded at the beginning of 2005 when *Technopolis Plc* was spun off from the Oulu Regional Centre of Expertise programme and established a separate company. The main shareholders of *Oulu Innovation Ltd* are the City of Oulu and *Technopolis Plc*. Together they own 55% of the company's shares and the rest are owned by local companies from the technology sector, the Oulu University of Applied Sciences and others. In comparison, VAXEY is not a limited company and therefore it has no specific owner, only participants belonging to the agreement. Moreover, the *Oulu innovation Ltd* works with a strategy for a longer time period, namely, six years while VAXEY has only set objectives for just over three years⁸⁷. The time factor has seen some criticism of the VAXEY agreement emerge and has been considered too short to achieve the best results possible or to meet all objectives.

Iceland is not an EU member and, therefore, not directly connected to the Lisbon Agenda. However, the growth agreement addresses the Lisbon goal in many ways. By enhancing the attractiveness of the region and increasing employment in the regions some of the Lisbon goals are met. VAXEY also supports entrepreneurship by counselling how to start a company and where to seek financial backing.

The VAXEY project is expected to make an effective contribution to regional development in the area with the cooperation of the government, local institutes and private parties. A single direct governmental policy framework, covering the broad spectrum of innovation for the different levels of administration (national, regional, local) does not exist in Iceland. Even though the topic is addressed in several legal and quasi-legal documents at the national level, this is the first project of its kind, which has the main task of promoting innovation in a specific region with national, regional and local support. Since the VAXEY project was initiated three other growth agreements have been established around Iceland, one each for the eastern, southern and western regions⁸⁸. Therefore it can be said that even though a direct framework for innovation does not exist, the growth agreements can be regarded as policy-related initiatives in this field. Even though there are, and have been, companies and institutes in Iceland promoting and supporting innovation, these growth contracts are now new elements and support more than just those areas specified in the contracts in respect of their innovation and regional economic growth requirements.

Since the growth agreement is the first of its kind in Iceland there are no other connections between the agreement and other regional and local programmes or strategies.

⁸⁵ VAXEY, growth agreement (2004).

⁸⁶ Oulu innovation (2007).

⁸⁷ Oulu Innovation (2007).

⁸⁸ Bjarni Jónasson (2007).

Focus of the instrument

Components of the Growth Agreement

The main components of the growth agreement are the establishment of four clusters. The four clusters have a common goal, to promote the Eyjafjörður region as an attractive residence option. In figure 6, the growth agreements platform is shown and it reveals the connection between the clusters and their roles in achieving the defined goals.

The Health Cluster is a forum for cooperation between companies and institutions in or near the Eyjafjörður area which work with health and health-related services. The most extensive operations are those of hospitals, along with healthcare and geriatric services and the education of health professionals. There is an assortment of other activities supporting these operations, directly and indirectly. An extremely rough estimate of the scope of the health sector in the Eyjafjörður area and neighbouring municipalities indicates that it encompasses some 1,500 jobs and has an annual turnover of around ISK 10 billion⁸⁹.

The goal of the health cluster is to improve services to customers, both those nearby and further away, by means of active cooperation, product development and research. Opportunities exist for entities in the Health Cluster to position the Eyjafjörður area on a national and global scale. According to indications, the principal means of augmenting health-related services in the area lies in services connected with rehabilitation, health-related information technology, and geriatric services. Three years after the establishment of the growth agreement a rehabilitation centre has been established, creating new jobs in the area and this is expected to expand further in the near future. The rehabilitation centre was one of many ideas supported by the health cluster. Other ongoing assignments include education for paramedics at the University of Akureyri, a project entitled: enhance life's quality with the years, a project for organizing Health days in Akureyri and projects connected with the older inhabitants of the area, to encourage them to participate more in activities and live life to the full during their retirement years⁹⁰.

The *Travel and tourism cluster* works in close cooperation with the North Iceland Tourism Marketing Office, which is an active forum for tourism cooperation in North Iceland. This Cluster has a special status within Akureyri's Regional Growth Agreement, since its area of operation is not confined to the Eyjafjörður area but includes the whole of North Iceland. From the beginning emphasis was placed on research and on building up the knowledge base within the tourism sector. Statistical information has been gathered on the tourism industry, market research conducted for winter tourism and an image study has been undertaken. In addition, regular surveys have been held among tourists. After a period of research the aim is now set on the further development of products and services. Many projects have been supported by the cluster and others are still ongoing or in development. Winter tourism has, traditionally, been more limited than summer tourism in Iceland, so the goal remains to enhance the number of visitors during the winter. 'Snow magic' winter weekends and 'nature by night' are all attractions to be marketed. This conclusion was built upon the research undertaken which also indicated that the area is ideal for growth in winter travelling⁹¹.

Cooperation has been established with two other clusters in the area, health and food. On the basis of this cooperative arrangement, two further areas namely, culinary tourism and health tourism have been developed. The former, as indicated by its name, concentrates on cooperation between food producers and restaurant and catering services to develop the local cuisine. This task involves a connection with the activities of the Food Cluster, for example regarding the Icelandic Food and Hospitality Show and the participation of Eyjafjörður food producers there⁹².

⁸⁹ VAXEY's Annual report (2006).

⁹⁰ Bjarni Jónasson (2007).

⁹¹ Margrét Víkingisdóttir (2007).

⁹² VAXEY's Annual Report (2007).

Operations in the Eyjafjörður area which fit into the *Food Industry Cluster* can be roughly estimated to yield a turnover of about ISK 30 billion per year and involve over 2,000 man-years. There is no doubt though that the Eyjafjörður Food Industry Cluster has great potential to grow and expand, and thus create numerous further employment opportunities. With regard to food production, the Eyjafjörður area has a strong reputation, and one of the cornerstones of the cluster's activities is to support and reinforce that image. By enhancing cooperation within the cluster, the sector and its reputation are to be further developed. Therefore many people from the food industry were called together at the beginning of the growth agreement. During this consultation process with the food industry numerous ideas and growth visions were discussed. A number of ideas came to light and many have already been implemented. Cooperation with the travel cluster concerning the local culinary endowment was also established. By marking the local products with the same brand, the products' origin and quality are highlighted⁹³.

From the outset of the meetings undertaken with the food industry representatives their mutual concern for waste in connection with food processing was brought up. It was considered as a problem because of the image and the costs related to the issue of waste. Out of these discussions a company named *Molta* was created. Only counselling support was provided from the growth agreement to establish the company. Financers are some of the biggest food companies in the region, Akureyri city and Waste removal of Eyjafjörður (Sorpeyðing Eyjafjarðar). Through *Molta* a foundation has however been built for a viable waste removal company, which will, in future, reclaim 10,000 tons of organic waste⁹⁴.

The future vision of the Leadership Group in the *Education and Research Cluster* outlines the Group's aim of becoming a vigorous platform for cooperation among companies, institutions and students in all fields of education and research, with special emphasis on the particular concerns of the Far North and environmentally friendly energy production. The Cluster is intended to form the hub of a powerful international network in these fields of interest. Significant annual real growth in the business area is anticipated in relation to the Far North and environmentally sound energy. For instance, the activities of the Cluster are expected to contribute to the raising of the educational level in the Eyjafjörður area. The aim of the Education and Research Cluster is, among other things, to link educational and research institutions with the commercial sector and other organizations in order to strengthen the involved parties.

The education and research cluster was one of the supporters of the establishment of the Renewable Energy Science School (RES). The school, which opened on the 9th of May 2007, is a result of four years of research and preparation. Among the partners of the growth agreement, the University of Akureyri and the University of Iceland supported the establishment. It is estimated that every year there will be some 50- to 80 students studying at the school and several jobs will be established. The RES implies that further education is available in the area; it attracts new inhabitants to the area, enhances research in the region and encourages innovation in the renewable energy sector⁹⁵.

⁹³ VAXEY's Annual Report (2007).

⁹⁴ VAXEY's Annual Report (2007).

⁹⁵ Björk Sigurgeirsdóttir (2007).

VAXEY'S platform

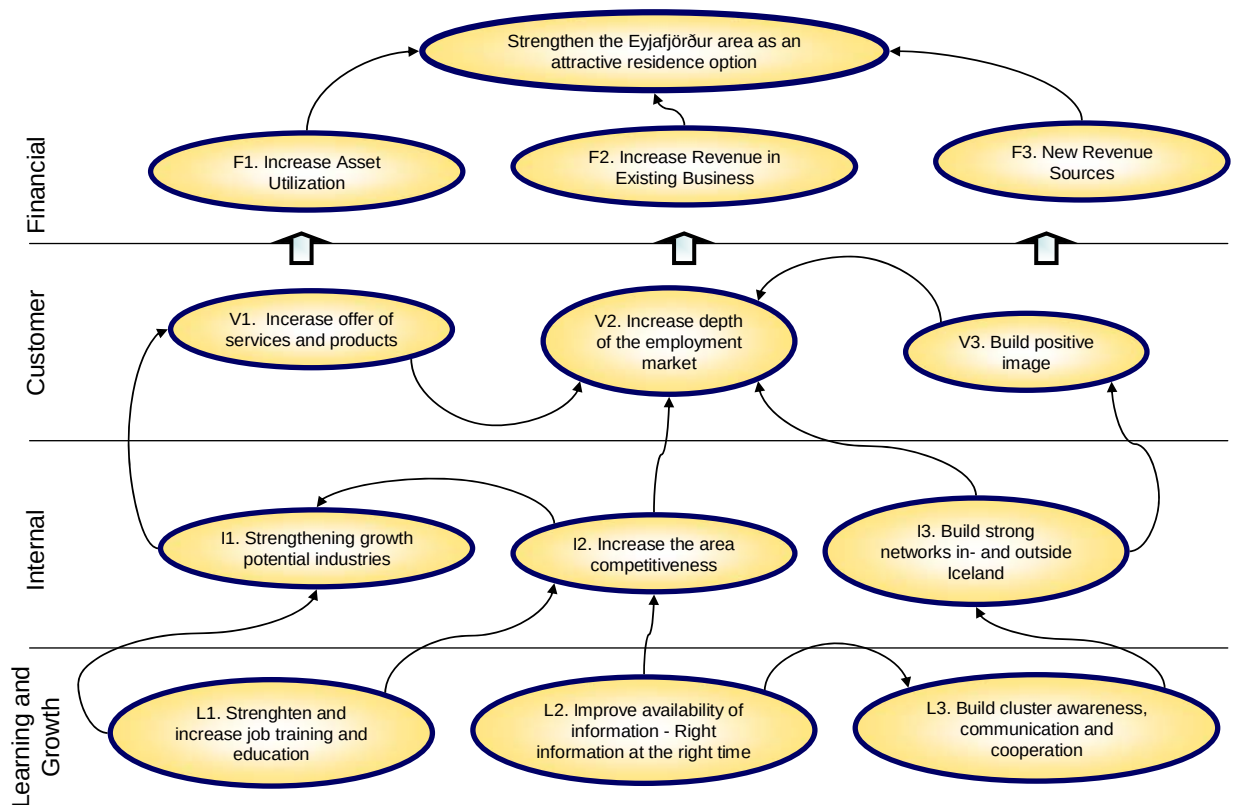


Figure 6: VAXEY'S platform

Innovation approach

There is no specific definition of innovation in the agreement. But all work and research which might lead to the establishment of new workplaces in the area, new professions and attract new skilled people to the area is considered to be an 'innovation' for the region. The innovation concept thus connects with VAXEY's stated goal of increasing the employment rate of the area. By enhancing the cooperation undertaken between different businesses within the clusters the aim here is to bring together the combined knowledge of different people and ideas and hopefully to initiate new projects and innovations in that specific cluster.

Geographical approach

The growth agreement was considered a necessary element in combating population decline in the Icelandic countryside. As the Eyjafjörður area was considered to already have significant potential for growth the project began there. Growth agreements have however now been established in other regions. The approach of enhancing strong sectors in each region by using a cluster approach is one way of countering the ongoing process of migration to the capital region by making other regions more attractive.

Conclusions

The VAXEY growth agreement has in many ways initiated beneficial projects by providing financial support and counselling. *Statistics Iceland* reports beneficial changes in the region's economic development, education and industry though it remains difficult to apportion all of the credit to the VAXEY growth agreement alone. The projects' goals to enhance the

attractiveness of the area increase the population and the education and research level and make the region more compatible with the capital area, are indeed very open and difficult to measure. The work undertaken within the clusters has established a foundation for the development of further work and programmes in the future. Collaboration groups have been formed in all of the clusters. Actors from companies and institutions of the clusters have in their meetings discussed many ideas for projects and innovations and their collaboration is seen as being highly promising for the region as a whole.

The growth agreement has not however been a success in all respects. One of the biggest criticisms has been the duration of the contract. All of the cluster project managers note, as well as the board member from KEA (Kaupfélag Eyfirðinga Akureyrar, cooperation movement), that the agreement was assigned for a too short time period and should have taken more notice of prevailing practice around the world, such as Oulu, which generally plan for at least 6 years at a time. Another criticism relates to the structure of the contract and to the fact that cooperation is governed 'top-down' instead of 'bottom-up'. As such it is argued that a growth agreement like VAXEY should see its board and structure focusing more on private companies and on actors in the regional communities rather than having the board assigned by the government. By keeping local people 'fully engaged' it is likely that the ideas and innovations produced will originate from the region's own intrinsic strengths where a top down approach is utilised positive outcomes in this respect are not as likely.

In general the growth agreement has initiated many projects and has had a significant influence on the region's economic development and further expansion. Quality research work has been undertaken forming a promising cooperative platform between different companies within the clusters and even between different clusters. The ideology of clusters, cooperation and competition, moreover, provides good results in respect of innovation in the area.

Significant interest remains in the area for the inclusion of more companies in the region in the project. Some companies however remain sceptical of working so closely with their competitors. This problem remains a significant obstacle for the project and has to be dealt with and rectified at the company level. The advantages of such cooperation also have to be better promoted to employers in the region. With more involvement and participation from local companies and employers work can be done more efficiently within the clusters. At the end of Vaxey's contract period discussions took place in respect of its continuance. Significant interest can be sensed in a further growth agreement albeit with a slightly altered strategy and platform. However, no formal decision has, as yet, been taken on this subject.

Governance of regional innovation policy in Norway

Norway comprehensively altered its regional innovation policy at the turn of the millennium. The rationale behind this change was to combine industrial growth policy with the aims of a more traditional regional policy. This has been quite successful, when compared to the other Nordic countries, since Norway seems to be the only country with a genuine desire to regionalise state-led regional innovation policy. However, the tools used in Norway (Arena and the NCE programmes) to a large extent mirror their Finnish counterparts (Regional Centre and Centres of Expertise programmes).

Introduction

In Norway interest in innovation policy is something of a recent phenomenon. Throughout the last decade innovation policy was seen as one of several activities within regional policy, competing with other objectives and priorities. The “innovation policy influence” on regional policy emerged through various sources, e.g. through primarily through programmes such as REGINN.⁹⁶

Norwegian innovation policy changed radically over the first years of the new millennium. During this period a sustained effort has been made to develop a “horizontal” or third generation innovation policy. It has changed from being a marginalised, sector-oriented policy into providing the mainstream policy context for industrial and regional policy. The most important feature is that innovation policy has been integrated with regional and industrial policy “at the level of policy objectives” and has, to some extent now, a regional dimension. Institutionally Norwegian innovation policy had been re-oriented and regionalised, and in addition it had been disconnected from its original point of departure, R&D policy.

The White Papers from the Labour Government in 2000, as well as Bondevik II in 2002 emphasised “favourable environments for innovation” as regional policy objectives. Parliamentary Bill no. 1 of 2003-2004 emphasised a priority towards regions and centres which display a growth potential; measures which may strengthen innovation and entrepreneurship in all parts of the country; increased delegation and the decentralisation of responsibility to the regional and local levels.⁹⁷

Norwegian innovation policy is currently developing a broader perspective. “From Idea to Value – the Government’s Plan for a Comprehensive Innovation Policy” (2003) is one step towards that goal. The government’s vision is for Norway to be one of the most innovative countries in the world where resourceful and creative enterprises and people are given the opportunity to develop profitable businesses. The overarching objective of the Government’s innovation policy is to facilitate increased wealth creation across the country. Areas that define the setting of the Government’s policy are: General conditions for trade and industry; Knowledge and competence; Research, development and commercialisation; Entrepreneurship – starting up new businesses; Electronic and physical infrastructure. This is, though, a policy formulated by the previous government and the new government, established in 2005, will formulate its own proposal.

⁹⁶ Mariussen, Å. & Fraas, M. (2005).

⁹⁷ Mariussen, Å. & Fraas, M. (2005).

Governance structures

Actors

Responsibility for innovation policy in Norway is divided between several ministries. The Ministry of Trade and Industry is however the lead partner while other important actors include the Ministry of Education and Research and the Ministry of Local Government and Regional Development. The leading partner in respect of regional policy is the Ministry of Local Government and Regional Development.⁹⁸

The Research Council of Norway was established in 1993 as a merger of the five former research councils. The institution bears overall responsibility for national research strategy and manages nearly one third of all public sector research funding. One of the principle tasks of the Research Council is to promote cooperation and coordination among Norwegian research institutions.⁹⁹ The Research Council has now been reorganised into three divisions: Innovations; Central Strategies; Basic Research. The innovation division has also established regional offices, linking up with the regional level partnerships.¹⁰⁰

Innovation Norway, the new state-owned company, was established in 2004 as a new organisation for innovation and internationalization. This organisation replaced four organisations: *The Norwegian Tourist Board*, the *Norwegian Trade Council*, *The Norwegian Industrial and Regional Development Fund*, and the previous *SND* and *Consultative Office for Inventors, SVO*. *Innovation Norway* is designed to promote nationwide industrial development profitable to both the business community and Norway's national economy and to help release the potential of different districts and regions by contributing towards innovation, internationalisation and promotion. *Innovation Norway* is a state-owned company that has offices in all Norwegian counties and in more than 30 countries world wide. The company is set to own and administer the present SND-network of offices around the country. These are to provide a "common point of entrance" to the policy instruments thus making them more easily available to their users.¹⁰¹

The Industrial Development Corporation of Norway (SIVA) is a state-owned enterprise established in 1968 to further the creation of business opportunities, and increased employment. Its goal is to develop strong local environments by providing investment capital, competence and networks for small and medium-sized companies. SIVA is represented in about 100 locations and it owns and operates industrial parks. In addition, it is a co-owner in ten science and knowledge parks and industry incubators.¹⁰²

Programmes

The REGINN programme (Programme for regional Innovations) ran during the period 1997-2001. The general idea was to stimulate innovation activities in enterprises, and to encourage regional R&D institutions to cooperate in networks with other actors "in the regional and national system of innovation". The Research Council of Norway launched the programme commissioned by the Government. In the programme 18 regional projects were selected and granted financial support. The programme was launched as an experiment with a focus on innovation processes and regional innovations.¹⁰³

The programme followed the four-year RUSH programme initiated in 1994 covering four colleges. The RUSH programme had the idea of developing an organisational model that could provide the regionally-based state colleges in Norway with a means to interact with the business community and thus improve their institutional role in the innovation system. The REGINN programme can be seen as taking over the mandate of RUSH by covering a

⁹⁸ Mariussen, Å. & Fraas, M. (2005).

⁹⁹ Mariussen, Å. & Fraas, M. (2005).

¹⁰⁰ Mariussen, Å. (2006).

¹⁰¹ Mariussen, Å. & Fraas, M. (2005).

¹⁰² Mariussen, Å. & Fraas, M. (2005).

¹⁰³ Norges forskningsråd (2002).

broader institutional and regional approach, specifically aimed at enhancing the institutional set-up in selected regions and its interrelationship with clusters or *milieus* of industrial firms. RUSH was however developed on a rather limited basis, lending attention to a single component in the innovation system.¹⁰⁴ The STEP-report (1999) *Regionale Innovationssystemer Innovation og læring i 10 regionale næringsmiljøer* analysed programme approaches.¹⁰⁵ Opinions concerning the programme seem to be twofold. In general the programme ran for only a short period and was not considered very successful. On the other hand this kind of regional support system and type of cooperation continues to be seen as a relevant approach.

The ARENA programme, established 2001, was designed to contribute to increased innovation and value creation through cooperation between business companies, knowledge providers and the public sector. The programme is intended for regional clusters based on a concentration of firms within a business sector and relevant R&D- and other knowledge institutions, and where there is a potential for strengthening interaction between these parties. The programme offers financial and knowledge support to the planning and implementation of long-term development projects. The projects being supported are based on regional initiatives and partnership between the leading players in the cluster.¹⁰⁶

The Norwegian Centres of Expertise (NCE) programme, introduced in 2006, was developed by SIVA, the Norwegian Research Council (NRC) and *Innovation Norway*. These are also the three organisations that made the selections for the Centres of Expertise. The plan is that there will be at least 10 such centres in Norway. The main objective is to develop Norwegian Centres of Expertise into entities with high potential for both innovation and internationalisation. This is made possible through skilful governance and the geographical concentration of activities. Innovative clusters based on excellence are being promoted to achieve higher competitiveness and innovation capital, which leads to better international visibility of clusters. The Norwegian Centre of Expertise programme is more business-oriented than the Finnish R&D focused programme. The Norwegian programme also emphasises and reflects to a greater extent the political objectives of the governmental departments.

Virkemidler for regional FoU og innovasjon (VRI) - programme (tools for regional R&D and innovations) runs during the period 2006-2016. The overall aim of the programme is to promote knowledge creation, innovation and value creation through regional cooperation and strengthened R&D contributions in regions. Regional needs and advantages are strengthened and both regional priorities and national innovation and R&D strategies are taken into account.¹⁰⁷ The programme will include the further development of existing tools and the development of new tools with regional relevance. This initiative will coordinate the Norwegian Research Council's research and innovation contributions to the regional level.

¹⁰⁴ Asheim; Fraas; Haraldsen; Hatling; Isaksen; Karsen; Lindelov; Mariussen; Onsager (1999).

¹⁰⁵ Asheim; Fraas; Haraldsen; Hatling; Isaksen; Karsen; Lindelov; Mariussen; Onsager (1999).

¹⁰⁶ OECD (2006). , ARENA: <http://www.arenanorge.no/>.

¹⁰⁷ Norges forskningsråd, <http://www.forskningsradet.no/>.

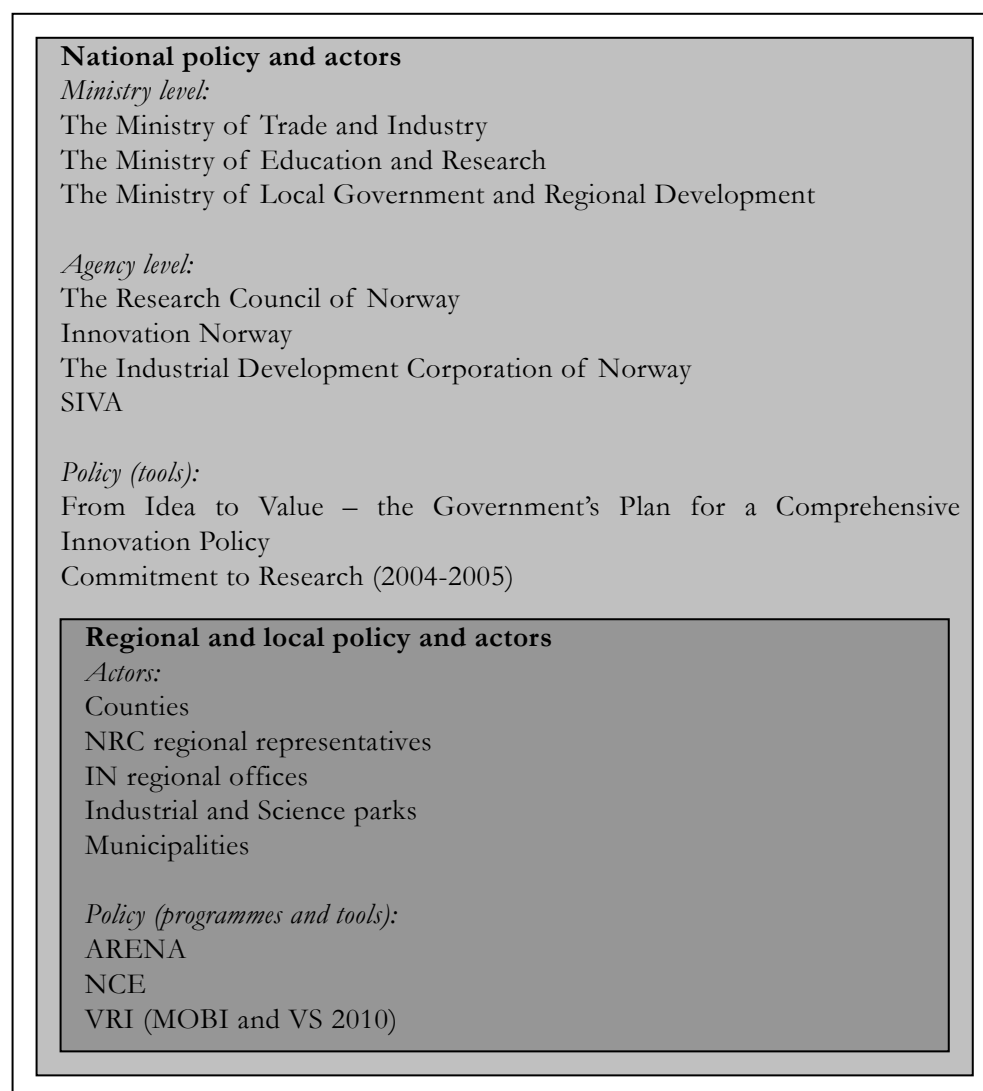


Figure 7: Organisational structure of policy actors and instruments

Role and structure of the R & D system

Norwegian innovation policy has changed radically over the last 15 years. In the 1990’s R&D, economic policy and regional development were treated separately, and focus was placed more on basic research. During the 1990’s research was not particularly linked to the current important objectives of innovativeness and competitiveness. This situation was acceptable for Norwegian “mainland industries”, as the raw material sectors outside the oil sector are called, since national economic policy favoured them, and aimed at increasing their competitiveness with a wide range of measures. Market forces alone were expected to take care of the development of high tech industry.¹⁰⁸

After 1991, responsibility for coordination of R&D policy was given to the Ministry of Education and Research and in particular to a new institution which was set up in 2003, a single Norwegian Research Council. The NRC is tasked with the coordination of all national research, in order to increase R&D efficiency while also bearing overall responsibility for the national research strategy. In addition it manages nearly one third of all public sector

¹⁰⁸ Mariussen, Å. (2006).

research funding. One of the central themes of Norwegian innovation policy is the interaction between education/research institutions and industry.¹⁰⁹

In Norway, the implementation of the Quality Reform in 2003 changed the constitution of university boards to ensure increased external representation. Institutions are obliged to collaborate with both the community and industry, and boards are requested to draw more than one third of their members from their local community.¹¹⁰ In the Government's report to the *Storting* (white paper) in 2005 a number of goals for research sector are set out. The Government proposes that public funding of research be increased. In the paper it is also declared that if Norway is to become a leading research nation, contributions are needed from researchers, society at large and business and industry - thus a joint commitment to research is needed.¹¹¹

A number of policy measures have been launched to increase the links between research institutions and industry. These efforts also include programmes at the regional level designed to contribute to innovation. *Mobilisation for R&D related innovation* (MOBI) was a collaboration to create innovation clusters. It was an umbrella programme implemented by the NRC. The main objective was to promote learning, innovation and value creation in companies with only minor R&D experience. The programme has a strong emphasis on regional innovation processes.¹¹²

Value creation 2010 (VS 2010) was an applied research programme (started in 2001) in cooperation between the *Confederation of Norwegian Business and Industry*, *The Norwegian Confederation of Trade Unions*, *Innovation Norway* and the NRC. The main objective of the programme was to encourage organisational development and innovation, both within individual enterprises and in learning networks between enterprises, based on new forms of cooperation between the industrial partners and other players of significance in the value-creation process. This is achieved through the active participation of researchers as development partners. The programme also supports the development of regional innovation strategies in regional partnerships.¹¹³ Since 2007 the MOBI and VS 2010 programmes have been incorporated within the VRI programme.

In Norway, a process of state agency regionalisation is currently taking place. The NRC and *Innovation Norway* have offices in all Norwegian counties (and in more than 30 countries worldwide). According to Mariussen (2006) the current drive towards the regionalisation of these agencies reflects the ambition to enable more scope for regional level integration into coherent strategies. Successful regional level coordination requires greater autonomy on the part of the regional operators of central-level agencies.

The reorganisation of the agencies provides the link from the central level to the operative end of the new chain of regional and innovation policy implementation and action, which is provided by regional development partnerships, development coalitions, industrial actors and entrepreneurs. The regional development institutions such as the '*fylkeskommune*' or county municipality now has greater responsibility in this area, and is defined as an important actor in the implementation of Norwegian national innovation policy, along with the local municipal institution. The Innovation division of the NRC and *Innovation Norway* cooperate closely, both at the national and regional levels, to enhance 'bottom up' mobilisation for innovation.¹¹⁴

The white paper *Regionale fortrinn – regional framtid* (St.melding.nr.12 2006-2007) from spring 2007 takes a major step further concerning regionalisation. In the white paper the government presents a model for regionalisation in the area of innovation that, from 2010, will engender a "binding commitment" between the national and regional levels. That

¹⁰⁹ Remøe; Fraas; Kaloudis; Mariussen; Røste; Ørstavik; Aanstad (2004).

¹¹⁰ Evanthia Kalpazidou Schmidt (2004).

¹¹¹ Ministry of Education and Research (2005).

¹¹² OECD (2006).

¹¹³ OECD (2006).

¹¹⁴ Mariussen, Å. (2006).

structure consists of three main elements; a) the common ownership of *Innovation Norway* between the state and the new regions, b) new regional innovation companies based on the regional innovation activity of SIVA and owned cooperatively by SIVA and the regions and c) new regional research funds. The Norwegian parliament has supported this solutions and continually tries to reinforce the position of the regions, especially in relation to the common ownership of *Innovation Norway*.

Focus of innovation policy

Subject matter

A new phase was launched in Norwegian innovation policy in 2004 when the government introduced its innovation policy objectives and the respective measures were put in place to develop this plan. In addition to major structural and administrative changes (the regionalisation of state agencies) the focus was directed much more on nationally funded apex R&D in the field of technology. The focus of the two national innovation promotion programmes, which have a regional emphasis, ARENA and Norwegian Centres of Expertise, will be discussed below.

One could crystallise the objective of the ARENA programme as enabling cooperation through public-private networks. This is expected to contribute to increased innovation and value creation among leading regional players in specific industrial clusters.¹¹⁵ The subject focus in the ARENA programme is quite wide, since its point of departure is located more in the field of traditional regional policy. Its aim is to develop regions with the help of their inherent strengths and through cooperation and networking. Thus, the focus has been set on a wide range of sectors, depending on which are important in a certain regional context.

The Norwegian Centres of Expertise programme clusters have been selected to form a focused, but still broad programme. The main objective here is to develop Norwegian Centres of Expertise into internationally acknowledged and visible clusters and this has been achieved more easily with a limited number of financed centres. The chosen centres represent the strongest industrial sectors in Norway. For example the underwater and seabed technology cluster in the Bergen area is a global leader in its respective sphere. Its development and R&D activities in the field are of highest importance to Norway, since it is related to the shelf oil development projects.¹¹⁶

Another, though perhaps not as strategically important in the national sense, is the CoE formed around engineering in the Kongsberg area. This cluster is based on traditional branches of engineering, such as the armaments industry and aviation, but also on more modern sectors such as space technology.¹¹⁷ However, it has to be noted that the first *tranche* of Norwegian Centres of Expertise selected are connected in one way or another to the marine and oil industries. Actually, it would be more proper to say that Norway has one or two sectors around which the CoE programme has been constructed. Luckily, seen from the regional equality perspective, centres where apex R&D and actual industrial production are taking place are geographically scattered. In spring 2007 three more NCE were appointed and located in Oslo, Stavanger and Bodø, covering cancer medicine, food and fish-farming respectively.

High priority in the programme is given to both internal and external evaluation of CoE projects and the programme itself. The promotion of innovations is believed to be most successful when follow-up is made on a regular basis. Evaluation criteria can and will also change during the process, so the whole system should develop into a broader learning

¹¹⁵ OECD (2006)., ARENA, <http://www.arenanorge.no/>.

¹¹⁶ Innovation Norway, http://www.innovasjon Norge.no/templates/Page_Meta_61537.aspx.

¹¹⁷ Innovation Norway, http://www.innovasjon Norge.no/templates/Page_Meta_61538.aspx.

process. As the evaluation goal-setting defines: “*Indikatorene skal være enkle og robuste – OG fange en kompleks og dynamisk virkelighet!*”

Does Geography matter?

The most important feature is that innovation policy has been integrated with regional and industrial policy “at the level of policy objectives” and it thus now has more focus on the regional dimension. Institutionally, Norwegian innovation policy had been re-oriented and regionalised, and in addition it had been detached from its original point of departure, R&D policy. Norwegian innovation policy now focuses on the local level and spatial distribution, so the process of the integration of innovation into general regional policy is under way.¹¹⁸ In the Norwegian regional development policy the settlement objective, implying the reduction of regional concentration and enabling of continued settlement in all parts of Norway is of great importance and thus also significantly influences the regional approach to innovation policy. For instance this implies that innovation measures for small and medium-sized enterprises located to rather “peripheral” regions have been developed.

Norwegian innovation policy thus seems to have taken a somewhat different point of departure to innovation policy in, for example, Finland. The Norwegian regional innovation strategy seriously aims to dissolve the conflict between regional development (growth) and spatial distribution (regional equality). The most important current task then is to find an appropriate combination of the two objectives. The regionalisation of innovation policy formulation, that is, of government sector agencies, has however been criticised. This is why, among other tasks, the NRC (Norwegian Research Council) has been encouraged to form regional offices in order to participate in regional partnership strategy formulation. *Innovation Norway* has also established offices on the regional level (*fylkeskommune*), which try to form strategic public-private partnerships between local and regional actors. This objective includes the work that is to be done in the field of networking and cooperation between *Innovation Norway* and the *Norwegian Research Council*.

Nordic and European influences

In general, Norwegian innovation policy seems to have adopted a somewhat different point of departure to innovation policy in Finland. The conflict of objectives within Norwegian regional and industrial policy between growth (regional development) and spatial distribution and cohesion throughout the country has now been imported into a core of innovation policy, as regional policy considerations of developing “all parts of the country” are now an integrated objective of national innovation policy. It is balanced with measures to revitalize and turn around the core national clusters (petroleum/maritime industries) as well as the core industrial regions.¹¹⁹

Many similarities can however be found between the national programmes which have clearly been influenced by the policies of neighbouring countries. For example, the CoE and the ARENA programmes share many similarities with the Finnish Centre of Expertise programme launched only a few years before while the ARENA programme is considered to have been influenced by the Swedish VINNVÄXT programme started in 2002.

Connections with the Lisbon Agenda

In the report *The EU Lisbon Strategy – A Norwegian Perspective* (2006) the goal that Norway, through trade and industry, will become one of the leading, innovative, dynamic and knowledge-based economies in the world within its various fields of comparative advantage is laid out. The establishment of conditions favourable to innovation and creativity are

¹¹⁸ Mariussen, Å. (2006).

¹¹⁹ Mauriussen, Å. (2006).

desired. The government will contribute to the development of innovative and competitive business by providing support within the fields of research and development, localisation and marketing, by being a partner in adaptation of new technology, by improving the supply of capital and by being a supportive owner.

Future perspectives

The Norwegian government embarked upon the road to putting in place a comprehensive innovation policy to meet future challenges with, “From Idea to Value – the Government’s Plan for a Comprehensive Innovation Policy” (2003) being the first step in this direction. The government’s vision for Norway is to be one of the most innovative countries in the world where resourceful and creative enterprises and people are given the opportunity to develop profitable business. The overarching objective of the Government’s innovation policy is to facilitate increased wealth creation across the country. Areas that define the setting of the Government’s policy are: General conditions for trade and industry; Knowledge and competence; Research, development and commercialisation; Entrepreneurship – starting up new businesses; Electronic and physical infrastructure.

Norwegian innovation strategy is formulated in the white paper entitled “Commitment to Research” (2004-2005). The government’s goal is to ensure that the country occupies a leading position internationally in terms of new knowledge, skills and technology. The government has decided to increase the level of investment in research to three percent of GDP by 2010. The following areas are given priority in respect of increasing funding: Firstly, internationalisation is to constitute an overall perspective in research policy and international participation will be emphasised when resources are channelled into research; secondly, fundamental research will remain a priority area; thirdly the government will invest in research-based innovation and business development. Priorities will be set in light of the need for increased research in and for regions with growth potential and few research activities.¹²⁰ It is also being discussed whether the 3%-goal is too ambitious and unrealistic within the context of the current Norwegian industrial structure. The continuing low investment levels in research recorded by the private sector have been the subject of much discussion in this regard.

Future objectives of the ARENA-programme and its relationship to the CoE programme

The Arena-programme has enjoyed a broad profile as an innovation promotion programme in comparison with the Norwegian CoE programme. This has been its strength, but in some respects also its weakness. One important feature of the programme has been the legitimacy gained among regional actors, the business sector and the R&D-community. The main emphasis in the future should be directed to better cooperation within projects and between ARENA-projects, between municipalities, between *Innovation Norway’s* district bureaus and between central state departments and regional actors in general.¹²¹

The extension of the ARENA-programme has also made it possible for minor regional actors and regions to take part in building a *national innovation system*, as Norwegians have named their national “project”. However, significant criticism has been directed towards the benevolent emphasis of the ARENA-programme - the evaluators say that ARENA was not initiated in order to promote equality among regions, but to promote those regional actors in the innovation field who have the potential to gain a nationally and internationally competitive position.¹²²

¹²⁰ Norwegian Ministry of Education and Research

¹²¹ Eriksson, B. & Furre, H. (2006).

¹²² Eriksson, B. & Furre, H. (2006).

One important field in the programme, which needs further attention, is that of coordination. Thus far, the most difficult task seems to have been the coordination of common contact surface between the Norwegian CoE-programme and other measures. In this respect a future goal should be to be able to develop ARENA-projects so that they could become CoE clusters: ARENA can work as a recruitment base for CoE. Of course, all ARENA-projects cannot and need not become CoE-projects, since ARENA has much wider perspective on innovation than the CoE. This difference should be endorsed, but the possibility of coordinating ARENA and CoE programmes on the same conditions should be seriously considered.¹²³

Better coordination is also needed from the national ARENA-programme officials in setting firm national goals and the ideology of the programme. This need is even more acute after *Innovation Norway's* regional offices obtained more responsibility for operative action in the programme. Once again, ARENA is not a *likestilling-programm*, but a programme where state priorities on innovation promotion are being carried out on the regional level. This orientation towards business and competitiveness should be turned into practice by giving business life a more central role in programme leadership and in the promotion, reproduction and spread of innovation.¹²⁴

Cooperation seems to be the most important current goal through which it is possible to increase the quality of the programme. As a matter of fact, most of the Nordic innovation programmes are continually striving for more cooperation. The problem, from the viewpoint of the promotion of future development, is how to *measure* achievements in this field. If institutions (and the people in them) are new, then in order to cooperate with local, regional and state actors much more effort and time is required than with, for example, cooperation between neighbouring *fylkeskommunes* or *kommunes*. So, to ask for more cooperation is always a relative question: the level of "good cooperation" is very difficult to define, while it is even more difficult to compare the level of cooperation between different Nordic contexts.

According to the evaluators, an important future objective remains the need to undertake the de-bureaucratisation of the ARENA-programme which should be accompanied by the adoption of a more business-oriented approach by the public authorities. However, this transferral of administrative duties from state regional development officials into the hands of regional and local business circles is, to some extent at least, in conflict with the goal of trying to keep the ideological-leadership of the programme in the hands of the state. The possibility that the ARENA-programme will thus become a tool designed to promote one or just few business sectors, instead of promoting a set of broader goals defined as state innovation policy should then at least be considered.

¹²³ Eriksson, B. & Furre, H. (2006).

¹²⁴ Eriksson, B. & Furre, H. (2006).

SIVA's innovation infrastructure operationalised in Oppland County

Introduction

In the following case study measures run by SIVA one of Norway's three main national innovation actors (The Industrial Development Corporation of Norway) are investigated. SIVA's role is to support the development of regional and local innovation environments. SIVA has developed an innovation infrastructure that consists of different elements mainly dependent on the regional setting. In the following case study we will highlight how the 'business garden' concept and the initiative distributed incubators work and are adapted in a regional innovation context. The investigated region is the rather peripheral *Oppland County (fylke)* located northwest of Oslo (see Appendix). In a Norwegian regional innovation context Oppland County is rather special, since it includes a variety of innovation measures, i.e. business gardens, innovation companies, knowledge parks etc. In addition, Oppland is a pilot region, since SIVA has established a common company with the *county municipality* in order to develop innovation strategies for the county.

SIVA's innovation infrastructure in the context of Norwegian innovation policy

Brief overview of SIVA's innovation infrastructure

Over the last five years SIVA has become more operative at the regional level. This is one example of the "regionalisation" of national agencies that has taken place in Norway. In general terms, SIVA's innovation infrastructure clearly relates to the Lisbon goals of encouraging entrepreneurship, improving regional attractiveness and creating more and better jobs. The overall goal here is to oversee the establishment of new companies and to ensure that old companies grow. The aim is also to make companies more knowledge-intensive. During the last five years little attention has been given to the instruments available in other countries. The desire now is however to actively gain impulses and ideas from other countries. Some years ago a nascent Nordic community existed between national actors working with innovation in the Nordic countries unfortunately however these meetings no longer exist.

SIVA's innovation infrastructure, or network, consists of:

- 25 knowledge / science parks
- 44 business gardens
- 18 incubators
- 11 industrial incubators
- Seed money and venture capital companies

In general the *science parks* are located in connection with universities, and the *knowledge parks* in connection with the regional higher education institutions. The business gardens (*naeringshager*) are a special measure for "*districts-Norge*" introduced in 1998. The business garden concept was developed with input from companies and other *milieus* such as, for example, knowledge parks in the districts and local communities concerned offering a co-

location for small and medium-sized companies. The target group is thus small and medium-sized enterprises, referring to 1-6 employees, both existing and new, and companies involved in innovation or production development. In the last two years special attention has been allocated to female entrepreneurs. Briefly, the services offered in the business garden include office facilities and infrastructure as well as competence, network and counselling. It is the local conditions and initiatives that are important for how the work in the business gardens is developed.

The first programme period for the business garden instrument was 1998-2006. The business garden programme was evaluated in 2004. The new period is 2006-2010. More than 50 business gardens have been established during these two periods. In the second round of the business garden programme, business gardens have been assigned a special task as local development actors in the regional innovation systems (see *distributed incubators* below).

The *incubator* concept was established by SIVA in 2000. From the start a national incubator system has been developed. Most are connected to knowledge and science parks. Companies belonging to an incubator are given access to resources for a period of 1-2 years. An *industrial incubator* implies an incubator connected to a major industrial company or an agglomeration of companies. By the end of 2006, 11 industrial incubators had been established. Here the target group is both established and start-up companies, larger companies and R&D institutions. The same type of services as in the business gardens, i.e. competence, network, counselling and office facilities, are offered.

The *distributed incubator programme* was launched in 2003 in order to connect the competence of the incubators with the business gardens. This implies that the incubators and business gardens are encouraged to cooperate with each other and with companies outside their local/regional context. The programme was initiated by the Ministry of Local Government and Regional Development (KRD) and is run by SIVA. The main aim here is to increase competence levels in respect of business gardens. If there is a business idea in a business garden the company can cooperate with an incubator which supports the idea during the development process. The role of the business garden is to provide the necessary physical infrastructure, to make sure that incubators are provided with ideas and to make sure that these ideas are developed with the assistance of mentors. The task of the incubator is to be responsible for the professional development and evaluation of the idea within their valuation system, share the competence within the incubators with the actors in the business garden and market the business garden as an attractive innovation *milieu*. The cooperation process can also work the other way around, implying that an idea from an incubator is developed in a business garden. This function has become important since the incubators have been encouraged to specialise. This implies that a new idea may not fit the profile of the incubator, but can instead be realised in a business garden.

Governance structure of the instrument

The business gardens are individually designed for a specific local context. However, the great demand for cooperation with different actors implies that the involvement of actors at the regional and national level remains important. SIVA has a cooperation agreement with all Norwegian county municipalities and is, for instance, involved with the county municipality in the discussions about the business development, i.e. what activities will be arranged and how they will be financed. This regional commitment began 2-3 years ago when the regional level was given greater responsibility for regional development. Previously it was the case that the regions were not consulted about the development of national instruments affecting the regional level. Now a dialogue has been established¹²⁵.

The role of the KRD is to finance parts of SIVA's programme. The important task of the KRD is to focus on the less central incubators, the business gardens and the so called

¹²⁵ Jon Johansen, SIVA

“distributed solutions”. The incubators and business gardens are central elements in the regional innovation infrastructure. They function both as an individual measure and as a measure that is coordinated with other elements of the regional innovation infrastructure¹²⁶. A cooperation committee (*samarbetsutvalg*) exists to bring together national actors working with innovation. This cooperation process began 2-3 years ago, and meetings are organised in order to circulate information about future programmes. This is one way to make sure that measures from different ministries do not overlap or that they are not contradictory.¹²⁷

In the development of a business garden, SIVA plays an active role as a partner for local communities and companies. A limited company runs the business garden and this constitutes its strategic core. SIVA's role is to, together with local and regional cooperation partners, ensure that the limited company has sufficient resources to constitute a driving force in the development the business garden. For SIVA it is important that the company is co-owned by the actors involved and that SIVA has a clear view of which actors ought to be included. Ownership is to be broad and can consist of banks, universities, research institutes, public actors, and the persons and/or companies related to the business garden or the surrounding *milieu*. In addition, the actors shall work towards the development of the region. In general terms SIVA is satisfied with the ownership structure of the limited companies and it is not difficult to engage actors.¹²⁸ SIVA is responsible for establishing networks at the national and international level, for instance organising meetings between the leaders of the incubators and business gardens.

Focus of the instrument

Concrete components of the instrument and connections with other innovation policy instruments

The basic idea behind the business gardens is to co-locate companies within the knowledge intensive business sector. By creating this *milieu* consisting of a number of smaller companies, a base for cooperation as well as a social and professional *milieu* is established. In the main different kinds of *physical infrastructure*, i.e. a reception area, switchboard, broadband connection, meeting rooms and secretarial services, are offered. Local conditions influence what kinds of companies are included in the business garden. Both new and traditional industries can be included. The most important thing is that the companies are considered to have the potential to develop while their integration into a larger competence *milieu* is considered to be something that would facilitate this development.

Innovation approach

The definition of the concept innovation is being continuously developed by SIVA and there is no specific or fixed definition. In general, the concept is defined as the establishment of new companies or the growth of already existing ones through a process of change and restructuring. Consequently there is a clear linkage with entrepreneurship. The innovation infrastructure mainly supports the start-up phase of companies or facilitates the development of already exiting ones by providing an improved competence *milieu*. SIVA has received extra money from KRD to encourage women to become more engaged in these business gardens. This measure, *Kvinnovasjon*, is to be horizontally integrated into already existing business gardens.

¹²⁶ Sandal, J. (2007).

¹²⁷ Jon Johansen, SIVA

¹²⁸ Jon Johansen, SIVA

Geographical approach

The general approach of SIVA's innovation infrastructure is that all instruments shall be available for all regions. However, the concept of business gardens is meant for areas lacking the potential to establish incubators, i.e. areas lacking higher educational institutions. In addition, the business garden instrument belongs to both the industrial policy (*näringspolitik*) and the regional policy (*distriktspolitik*). Here there is potential conflict concerning the different objectives of these policy fields. In the industrial policy it would for instance be good to reduce the number of business gardens in order to retain efficiency. In the context of regional policy however the business gardens have a function of guaranteeing that there is employment in the regions and that people can continue to live there. This provision is something that industrial policy has to take into consideration.¹²⁹

SIVA's innovation infrastructure applied in the regional context of Oppland County

The regional context of Oppland County

Oppland County is located north west of Oslo. In Oppland, the major towns are Lillehammer, Gjøvik and Otta. The number of municipalities (*kommuner*) is 26. Oppland County is divided into following sub-regions:

- The Lillehammer-region
- The Gjøvik-region
- Hadeland
- Midt-Gudbrandsdal
- Nord-Gudbrandsdal
- Valdres

Table 4: Fact sheet about Oppland County

Area	24,073 km ² * (around 25 percent below 600 meters sea level)
Inhabitants	183,204 (2006)** (4.01 % of the national population)
Population density	8 inhabitants /km ² (national average 15)**
Population structure (2005)	
0-14	18 % (national average 20 %)
15-64	64 % (national average 65 %)
65+	18 %** (national average 15 %)
Population change 2002-2005	-0.1 per thousand (national average 6,2 per thousand)*
Relative annual average	
Number of persons employed (2005)	83,280**
Employment rate (2005)	75.8 % (national average 74.8 %)**
Unemployment rate (2005)	3.6 % (national average 4.4 %)**
Gross Regional Product total (2001)	35,406 million NOK*
GRP/capita	193,130 NOK*

*www.oppland.no

** Neubauer, J. *et al* (2007).

¹²⁹ Jon Johansen, SIVA.

The industrial structure has traditionally been rather dependent on the metal industry in Raufoss. This industry was rather insular until only a few years ago. Then a complete restructuring process took place. The number of employed people in the public sector corresponds to almost 40 percent of the total. In addition, tourism is important to the economy. Around 20 percent of the working population is occupied in the service sector (hotels and restaurants).

One important element for regional development in Oppland County is the locally and regionally initiated working reform *Fritt Fram*. Through this bottom-up initiative the region and municipalities challenged the national level to apply a holistic approach instead of traditional sectoral thinking to the future development of the region. This initiative has precipitated major changes in the framework conditions of the region. Thanks to this initiative the working procedures have been changed and the focus is now on how actors at different levels can jointly strengthen development activities in the region. The response to the initiative from the concerned ministries was, in general terms, positive. However, negotiations with the various ministries involved have not always been easy. The attitude of the KRD has been positive concerning an increased role for the regional level in the regional development process.¹³⁰

The regional governance structure of SIVA's innovation infrastructure

SIVA is, together with the municipalities and Oppland County Municipality, responsible for developing and establishing business gardens, knowledge parks and science parks within the region. The science parks are used as a tool for innovation and restructuring projects, arena constructing etc. The role of the business gardens is to function as a local and regional development centre and as a platform for new businesses in Oppland.

The notion of innovation has gradually emerged onto the regional agenda. SIVA is well represented in Oppland. There are two knowledge parks, Lillehammer's (established in 1999) and Gjøvik's (established in 1998). In Oppland there are four business gardens:

- Valdres næringsshage
- Vågå næringsshage
- Kapp næringsshage
- Landsbyen næringsshage

The first Norwegian incubator for tourism was opened in Lillehammer in 2006. The incubator will work with the development of good ideas for experience-based tourism in Oppland and neighbouring counties. There are also plans for this incubator to become a so-called *distributed incubator* and for it to work on co-action (*sambhandling*) with actors outside the region. The competences and network in the Lillehammer environment will thus be used by others regional and national actors and environments.

In Oppland, there is also a goal to develop a "*Senter for Informasjonssikkerhet*" in Gjøvik, which is to be included in the NCE programme. The Arena programme is also of importance, and for instance there is an application here concerning the development of the bio-energy sector. In addition, it is stressed that there the goal exists to establish an *Innlanduniversitet*, since research and development and applied science are important contributors to innovation and growth.

Cooperation between the key actors

Oppland is working actively in order to be in command of regional development in the region. The pilot project "*Fritt fram*" has overseen increased local and regional decision making concerning regional development money in cooperation with the KRD's initiative to distribute regional responsibilities. In the *Oppland Fylkesplan* 2005-2008, the overriding

¹³⁰ Hjalmar Solbjør, Oppland fylkeskommune.

political development document for the region, a partnership with a number of organisations, i.e. *Fylkesmannen* in Oppland, *Aetat*, *Innovation Norway*, the Norwegian Research Council, VOX; *Høgskolen Gjøvik*, *Høgskolen Lillehammer* and SIVA are mentioned as being crucial for overall regional development. The county municipality considers cooperation with the national agencies and the municipalities as good. The cooperation with other innovation policy actors at the national level is considered to be good from the county municipality point of view. In a Norwegian comparison a rather unique institution has been established. The *Oppland innovation centre (nyskappingscentre)* in Lillehammer is an arena where the department for regional development of the county municipality is co located with the regional offices of *Innovation Norway* and the Norwegian Research Council. SIVA will also share the premises since the company, which they co-own with the county municipality will be located here. The Oppland county municipality has worked hard to establish this arena. The *Fritt Fram* initiative was one of the most important factors in ensuring that the NRC district office was located to Lillehammer.¹³¹ From the county municipality's point of view the dialogue with SIVA is considered to be good. Oppland belongs to one of two pilot regions where a common limited company between the county municipality and SIVA has been established in order to develop innovation work in the region. Cooperation here is dependent on a continuing and intensive dialogue between the county municipality and SIVA.¹³²

The establishment of a business garden entails a process of finding new business actors who wish to participate and anchor the idea at the local level. The existence of a strong sense of local engagement is considered to be a likely indicator of success. Its establishment may, however, be problematic *per se*. The relocation of existing companies to a new building may imply that a local landlord loses a tenant. Here it is important that the business garden implies a contribution to, and a stimulation of, the local development.¹³³ Both SIVA and the regional level are satisfied with how the demand for cooperation between different actors has been met in the business garden. The business community has been fruitfully engaged in the process. In addition, the funding gained from the local level is increasing in the newly established business gardens. In i.e. the *Kapp* business garden the local and regional business community is well represented in the ownership of the establishment.¹³⁴

From the perspective of *Kapp* business garden a definition of functions has however been seen as essential in order to avoid competition and overlapping measures. This was for instance important when the establishment of the innovation centre took place. In addition, *Kapp* business garden had to clarify what role they would have in comparison with the regional *Näringsråd*. After some discussions it was decided that the *Kapp* business garden was to focus on new establishments while the *Näringsråd* was responsible for already existing companies.¹³⁵

In general, the actors concerned are satisfied with the cooperation. However, a problem emerged in respect of the fact that sometimes SIVA is seen to move too fast with its initiatives. This becomes a problem since it takes time to anchor decisions and to establish the local and regional commitment which is essential to the development of a successful business garden. The establishment of a business garden is a rather long process and a required specification must be developed and anchored by the participating parties. The county municipality provides seed money for this process.¹³⁶

The whole idea of business gardens is that they should be developed for, and adjusted to, the requirements of the environment in which they are placed. Due to the different overall objectives of the involved stakeholders however it may be the case that the actors involved

¹³¹ Hjalmar Solbjør, Oppland fylkeskommune.

¹³² Hjalmar Solbjør, Oppland fylkeskommune.

¹³³ Hjalmar Solbjør, Oppland fylkeskommune.

¹³⁴ Jon Nisja, daglig ledare, Kapp Näringshage.

¹³⁵ Hjalmar Solbjør, Oppland fylkeskommune.

¹³⁶ Hjalmar Solbjør, Oppland fylkeskommune.

require different things. The county municipality thus stipulates that this process must be clearly developed and that it should be clearly outlined beforehand what it is that the business gardens should spend time on, in order to steer the development of the establishment. If this is not done there is a risk that the business garden develops too much in its own direction. The focus must be on commercial activities, innovation development and the starting up phase of new companies.¹³⁷

Inclusion of SIVA's innovation infrastructure in regional and local programmes and strategies

As mentioned previously the Oppland region has a rather comprehensive approach to innovation. In the regional action plan from 2007 it is stated that it is important that the work to start up new companies is connected with innovation measures. The measures and programmes are not limited to those that SIVA offers. All elements of the national innovation system are encouraged to connect with each other and to cooperate. This has also been done in practice. The knowledge park in Gjøvik has for instance been active in the establishment process of the *Kapp* business garden. The *Kapp* business garden now also plans to initiate cooperation with the Lillehammer knowledge park concerning creative industries.¹³⁸ Different actors, i.e. the knowledge park in Gjøvik, have also cooperated such that Raufoss Industrial park was included in the Norwegian Centre of Expertise programme in 2006. It is however difficult to pinpoint one actor as being responsible for this achievement. The interaction between the different establishments is also displayed by that the business garden in *Kapp*, focusing on industrial design, cooperates with Raufoss Centre of Expertise.¹³⁹

At the local level, the business garden is included as a promotional tool in respect of local development. The *Kapp* business garden was for instance invited to present its activities during events aiming to promote the area as an attractive housing and working alternative.¹⁴⁰

Focus of the instrument

Usage of the concrete components of SIVA's business garden concept

As stated above the business garden concept mostly offers help with physical infrastructure and counselling. The manager of *Kapp* business garden describes the services provided such that the companies get access to an "advanced doorman" by being included in the business garden. Different key actors involved provide different kinds of support. For the *Kapp* business garden the role of the municipality has for instance been to pay some of the rental costs for the building where the business garden is located.¹⁴¹ For companies it is attractive to be a part of the business garden, since they get access to services that would not have been available otherwise. One problem however is that the business garden is filled rather quickly. Here there is a need to have enough space so that good new ideas can be included and developed. Another problem is that the business gardens/companies have difficulty surviving on their own when the programme ends after 4-5 years.¹⁴²

Innovation approach

Oppland county municipality has developed definitions of innovation and entrepreneurship. The definition of innovation mainly relates to the fact that new ideas can be developed and produced in either new or already existing companies. The innovation concept is thus generally related to entrepreneurship.¹⁴³ This definition does not contradict the definitions

¹³⁷ Hjalmar Solbjør, Oppland fylkeskommune.

¹³⁸ Jon Nisja, daglig ledare, Kapp Næringshage.

¹³⁹ Jon Nisja, daglig ledare, Kapp Næringshage and Hjalmar Solbjør, Oppland fylkeskommune.

¹⁴⁰ Jon Nisja, daglig ledare, Kapp Næringshage.

¹⁴¹ Jon Nisja, daglig ledare, Kapp Næringshage.

¹⁴² Hjalmar Solbjør, Oppland fylkeskommune.

¹⁴³ Hjalmar Solbjør, Oppland fylkeskommune.

used by SIVA. But from the point of view of the *Kapp* business garden it is important that the notion of innovation is not only about ideas. The ideas have to be developed into concrete services and products with a market potential. The degree of innovativeness however varies between the different companies belonging to the business garden. Some of the companies, i.e. auditing firms, may not be that innovative, while others are really working with the development of an innovation.¹⁴⁴

The definition of 'innovation' can be related to the overall goals of the performed policies. For the county municipality it is very important to create environments which enable knowledge intensive businesses to grow. This is important since this is one way to make sure that those persons who have previously left the region in order to get an education can return. For educated persons it is important that they can use their education and find relevant work places where it can be used or that they can create their own business.¹⁴⁵

Geographical approach

A significant challenge for Oppland County remains that significant regional differences remain *within* the county. However, SIVA's innovation infrastructure includes elements for different types of regional and local contexts while Oppland county municipality actively tries to make sure that the different instruments at hand are used. In the Gjøvik area, the region has been successful in supporting the regional profile based on knowledge and industrial technology. In other areas tourism and national parks are of great importance. Even if SIVA's instrument is to be adjusted to local and regional conditions some problems remain. For the business garden in Nord-Gudbrandsdal, the actual focus may be on national parks since there are many such parks in the area. SIVA's main focus is on innovative environments and new companies, and this may be difficult to achieve within this particular regional profile. For Oppland county municipality it is important that realistic goals are established and that the developments undertaken have a realistic chance of survival in the region.¹⁴⁶

Conclusions

The case discussed here illustrates the fact that considerable effort is made to facilitate entrepreneurship and innovation in Norway. A minor discrepancy can be seen between the "national" and "regional" interpretations, concerning the *objectives* of SIVA's innovation infrastructure. SIVA's overall goal is to start new companies. This is also important for the county municipality; however the innovation infrastructure is a means to meet the overall goal, which is to ensure that people can work and live in the region. A very pragmatic approach is used for defining *innovation* at both the national and regional levels. Major conflicts are thus avoided and many things are thus made to 'fit' into the concept.

The multitude of available instruments may imply that a rather murky distinction exists between the various instruments implying that, by extension, there is a risk of inefficient use and even of competition in respect of the target groups. However, significant coordination already takes place between the national actors responsible for innovation policy measures. Cooperation also exists between the various actors at the national and regional/local levels. The regional level in Oppland County takes an active role in using the instruments available. The locally inspired *Fritt fram* initiative provides an important opportunity to put in place a holistic approach to regional development. The situation in Oppland thus seems to be rather unique in a Norwegian context. Several factors, i.e. the previous dominance of a few industries and the *Fritt Fram* initiative notwithstanding, may explain this.

¹⁴⁴ Jon Nisja, daglig ledare, Kapp Næringshage.

¹⁴⁵ Hjalmar Solbjør, Oppland fylkeskommune.

¹⁴⁶ Hjalmar Solbjør, Oppland fylkeskommune.

For Oppland County a challenge remains in that the region continues to exhibit major *internal differences*. Consequently, the national level must also have this in mind when policies for the regional level are developed. Efforts have been made in this direction, since SIVA's innovation infrastructure includes measures for almost every kind of geographical context. But the differentiation may be questioned since SIVA tends to have a more nationally-based view on the establishment of the innovation infrastructure while the county municipality stresses that "regional needs" must also be met.

From the regional point of view a challenge remains in that the existing innovation structure continues to be highly dependent on public funding. An overall objective must then be that the innovation structure becomes less dependent on public funding and that commercial thinking is improved. Access to venture capital is essential in order to develop good ideas. In Oppland (plus Hedmark) there are no major companies and no headquarters that can be used in this process as in other parts of Norway where fisheries, gas and the petroleum industry are located. Discussions have taken place in respect of whether the business garden programme will continue. These discussions relate to questions over the role the "public" and the market may have in respect of innovation. At present the role of the public is to be active in the start-up phase of business gardens and companies. Thereafter the market assumes responsibility. It is however considered problematic in some quarters to simply let the market take responsibility for this specific task. In addition, the state money invested is mostly paid back in 8-10 years through increased turnover and the generation of capital.¹⁴⁷ For the business garden concerned it is important to have a long-term perspective concerning the funding issue, since funding conditions need to be predictable. Framework money is needed for i.e. development projects. The ultimate origin of the money taken in is not however important for the business garden itself.¹⁴⁸

¹⁴⁷ Jon Johansen, SIVA.

¹⁴⁸ Jon Nisja, daglig ledare, Kapp N rinshage.

Governance of regional innovation policy in Sweden

Swedish innovation policy has traditionally developed within the growth and research policy streams. The strategy “Innovative Sweden” (2004) developed by the former government included a new broader approach to innovations and integrating the separate policy fields. The strategy also emphasised the importance of local and regional circumstances. The current government explicitly addresses innovation in its Regional Growth policy and the National strategy for regional competitiveness, entrepreneurship and employment 2007-2013. At the regional level innovation policy is closely linked to the Regional Growth Programmes, the main regional policy tools. Another important tool in this context is Vinnova’s VINNVÄXT-programme which has a more direct focus on regional innovation systems and clusters. In addition, the cluster programme, run by Nutek, addresses the development of clusters and innovation systems at the regional level.

Introduction

The concept of ‘innovation policy’ was little used in Swedish political rhetoric until the beginning of the new millennium, although the importance of innovation and the production of new knowledge for economic growth have been widely recognised. The political agenda has developed along two different strands, one in growth policy and another in research policy with innovation lodged, somewhat uncomfortably, somewhere in between.¹⁴⁹

By the end of the 1990s Swedish growth and development policy had embarked upon a process of transformation from a more centralised and traditionally redistributive socio-economic policy towards what was termed regional development policy. The new policy was mostly put into practice in the context of the Regional Growth Agreements (1998) that eventually metamorphosised into Regional Growth Programmes in 2004. At the time when this new regional development policy was being formulated however interest in the entrepreneurs’ role in the process also increased. Innovation questions received greater attention, though they continued to be understood, primarily, in the context of “inventor support”.¹⁵⁰

A broader systemic approach to innovation policy was however required in order to better respond to the envisaged challenges. The first steps in that direction were taken at the turn of the century by the establishment of Vinnova (the Swedish Governmental Agency for Innovation Systems) in 2001. In 2004 Swedish research and industrial policies were fused together into a united innovation policy. The policy “Innovative Sweden – A Strategy for Growth through Renewal” was adopted by the Minister for Industry, Employment and Communications and the Minister for Education and Science (and was subsequently adopted by the previous government) as a framework for developing policies in line with the Lisbon strategy. At the same time the ongoing process of the decentralisation of regional development policy continued apace.¹⁵¹

Even today however the need remains for the adoption of a broader more systematic approach to innovations enabling a better response to be made to emerging challenges. Up until the election in 2006 the previous Swedish government stressed the importance of building an innovative capacity by focusing on four priority areas: *knowledge base for innovation, innovative trade and industry, innovative public investment, and innovative people* in the Swedish

¹⁴⁹ Granat Thorslund, J; Elg, L. & Sandgren, P. (2005).

¹⁵⁰ Granat Thorslund, J; Elg, L. & Sandgren, P. (2005).

¹⁵¹ Granat Thorslund, J; Elg, L. & Sandgren, P. (2005).

innovation policy. The strategy emphasised the effects of globalisation and at the same time also pointed to the significance of local and regional environments.

The current government however stresses in its new *Regional growth policy*¹⁵² that it wants “an active policy of renewal that gives all areas of the country the opportunity to develop on the basis of their own strengths and contribute to the common good” thus making use of all of Sweden’s strengths. The objective is to develop innovation capacity in all areas of the country and to increase local and regional competitiveness. The fundamental basis of this is the need to ensure enhanced local and regional influence on, and responsibility for, central government funds. Growth and increased competitiveness are considered necessary in order to build on a better climate for entrepreneurship, innovation and investment. Here the wise usage of the unique conditions found locally and regionally are stressed. To summarise, the aims of the new regional growth policy are the following:

- Greater local and regional influence on, and responsibility for, central government funds
- To make use of the unique conditions for individual development and corporate competitiveness found in different types of regions, such as sparsely populated and rural areas, small and medium-sized towns and metropolitan areas
- Strategic government initiatives and measures for sustainable growth in interplay with actors at local, regional, European and global levels
- A cross-sectoral working method and a more coordinated central government interacting with local and regional actors
- Good access to commercial and public services for citizens and businesses in all areas of the country
- Increased labour supply through such means as regional enlargement and increasing mobility within and between regions
- Regional strategies and programmes conducted with the support of partnerships and in interplay with the national and European levels, aimed at strengthening local and regional sustainable growth efforts.

The means to achieve these objectives will be political measures that promote entrepreneurship, innovation and renewal, skills supply and increased labour supply, accessibility, and a good level of service. This is necessary to enhance local and regional development capacities.

According to the National strategy for regional competitiveness, entrepreneurship and employment 2007-2013 (*En nationell strategi för regional konkurrenskraft och sysselsättning 2007 – 2013*), regional competitiveness is to be strengthened through increased capacity for innovation and renewal. Innovation is seen clearly in the political agenda and an innovation systems view is slowly but surely taking hold. The strategy has four priorities; Innovation and renewal, Skills supply and improved labour supply, Accessibility, and Strategic cross-border cooperation. Regional development programmes, regional growth programmes, regional Structural Fund programmes for regional competitiveness and employment, and territorial cooperation programmes constitute important tools for the implementation of the strategy as well as of local and regional priorities and initiatives. The strategy also specifies guidelines for implementing the EU Structural Fund programmes in Sweden. In addition, the strategy guides the national agencies’ participation in regional development work. In September 2007, the Government took a decision on a new Ordinance on regional growth efforts (2007:714), which will enter into force on 1 January 2008. The new Ordinance specifies and clarifies such matters as government agencies’ participation in regional growth efforts. The Ordinance is intended to contribute to increased vertical and cross-sectoral cooperation between different actors. To further stimulate national agencies’ participation in regional development work,

¹⁵² Regeringens budgetproposition 2007/08:1, UO19 Regional utveckling

the Government has taken a decision on thematic government agency groups (N2007/5727/RT). These groups are to develop cross-sectoral cooperation forms that strengthen cooperation between government agencies and between agencies and local and regional actors. The Government has also established a national forum to create an arena for continuous political dialogue between national and regional representatives on issues that are important for regional development.

Governance structures

Actors

In Sweden several public actors and institutions work with innovation policy at the national and regional levels. The system has a strong central actor responsible for Swedish innovation systems, Vinnova. Another national level actor within this field is Nutek (Swedish Agency for Economic and Regional Growth). ALMI companies and the County Administrative Boards, being the state representative at the regional level, are also important actors at the regional level within the field of industrial and innovation policy in the sense that they develop local conditions for private enterprises to operate. At the regional level municipal coordination bodies (*självstyrelseorgan/samverkansorgan*) have been established in most counties (by 1 January 2008 16 out of 21 counties will have established such bodies). According to the legislation in place these bodies will take over some of the responsibilities for the regional development from the County Administrative Boards. Among other things they will be responsible for regional development programmes.

Vinnova is tasked with the promotion of sustainable growth through R&D financing and the development of effective innovation systems. Vinnova's particular area of responsibility is in innovations linked to research and development – i.e. ground-breaking, successful products, services or processes with a scientific base. The tasks here include funding the problem-oriented research that a competitive industry and a flourishing society require, as well as, strengthening the networks that are a necessary element of this work. In addition, an important task is to analyse in what areas there is real potential for innovations and growth. Vinnova is currently running programmes in the following areas: information and communications technology, services and the use of IT, biotechnology, the development of working life, transport, product development and materials.¹⁵³

Nutek is responsible for developing entrepreneurship, growth in enterprise and strong regions. The Agency's task is to support the business sector with information, advice, corporate financing, to improve the conditions for starting new enterprises as well as providing support for the internationalisation of the tourist industry.¹⁵⁴ Nutek is also tasked with supporting the County Administrative Boards and the municipal coordination bodies in the work towards developing strategies and programmes connected to the regional development programme, regional growth programme, Structural Funds programme and project activities.

The *ALMI*-group was founded in 1994 with the mission of stimulating growth and development in small and medium-sized companies and innovators offering financing and business development counselling. The ALMI-group consists of a parent company, owned by the government, and 21 regional offices. Each of the regional companies is owned by the parent company (51%) and by the county council in which they are located (49%). The companies are particularly familiar with local conditions and each company plans its activities based on variations in the local business structure. This ties the organisation strongly to the regional level while providing full national coverage. The goal here is to ensure that more innovators reach the market, to stimulate new businesses and to promote the development of competitive companies – and thereby to create growth and renewal in Swedish industry

¹⁵³ Vinnova, <http://www.vinnova.se/>

¹⁵⁴ Nutek, <http://www.nutek.se/>

and commerce. The services are oriented towards innovators and new entrepreneurs as well as small and medium-sized companies.¹⁵⁵

The IDC (*Industrial Development Centre*) network could provide the "missing link" which will enable co-operation between enterprises and other important actors at the regional level. The Ministry of Industry, Employment and Communications signed a deal with the IDC companies of a network to carry out the UPA-commission (Finding, Product Development and Product Pre-study Spin-offs) on the national level. The commission's work aims to identify, support and intensify product development and spin-offs particularly in small and medium-sized enterprises across the industrial sector. This development is expected to happen in close cooperation with large enterprises, higher educational institutes and research institutes and other competent centres in regions. The owners are mainly small and medium-sized enterprises, trade unions and municipal companies.

Programmes

The VINN EXCELLENCE CENTRES programme aims to strengthen the research and innovation environments. The objective of Vinnova's programme is to develop universities as research resources for industry and the public sector by creating strong and internationally attractive environments offering scientific excellence, growth and benefits to all the actors involved.¹⁵⁶

The VINNVÄXT programme (Regional Growth through Dynamic Innovation Systems), initiated in 2002 and run by Vinnova, aims at the promotion of growth and international competitiveness within the functional growth areas through problem-oriented research and development of innovation systems to internationally competitive levels. This programme has a more direct focus on regional innovations and clustering. The programme is designed "to promote sustainable growth in the regions based on the nurturing of internationally competitive abilities, by successively developing or further developing the functioning, dynamics and effectiveness of innovation systems in functional regions at the international level." About 70 initiatives have sought financing in the two calls and eight regions have won in the "VINNVÄXT competition".

The INSTITUTE EXCELLENCE CENTRES programme aims to strengthen the research and innovation environments at the institute level in Sweden. The idea behind this programme, led by Vinnova, is that the research institutes complement ongoing collaboration between industry and research programmes at universities and colleges. They represent an important resource, not least for small companies that need external competence in order to modernise and develop.

Innovationsbron AB is an incubator programme run by Vinnova. This programme aims at creating and strengthening the environments for new knowledge-intensive companies, so-called incubators that are linked to Sweden's universities. Innovationsbron AB was created in spring 2005 by the seven Teknikbrostiftelserna, the Industrial Fund and the Swedish government. The programme is designed to commercialise new ideas and products emanating from research and development. The activities aim at creating self supporting structures, incentives and policies for improved knowledge exchange between academia and industry. This will be done through better commercialisation activities for university-based ideas and innovations, simple and effective entrance functions for companies into universities and the identification of academic products and processes according to industrial needs. This new organization also has a focus on innovations emerging from the business community.¹⁵⁷

¹⁵⁵ ALMI, <http://www.almi.se/>

¹⁵⁶ Vinnova, <http://www.vinnova.se/>

¹⁵⁷ Innovationsbron, <http://www.innovationsbron.se/Templates/157.aspx>

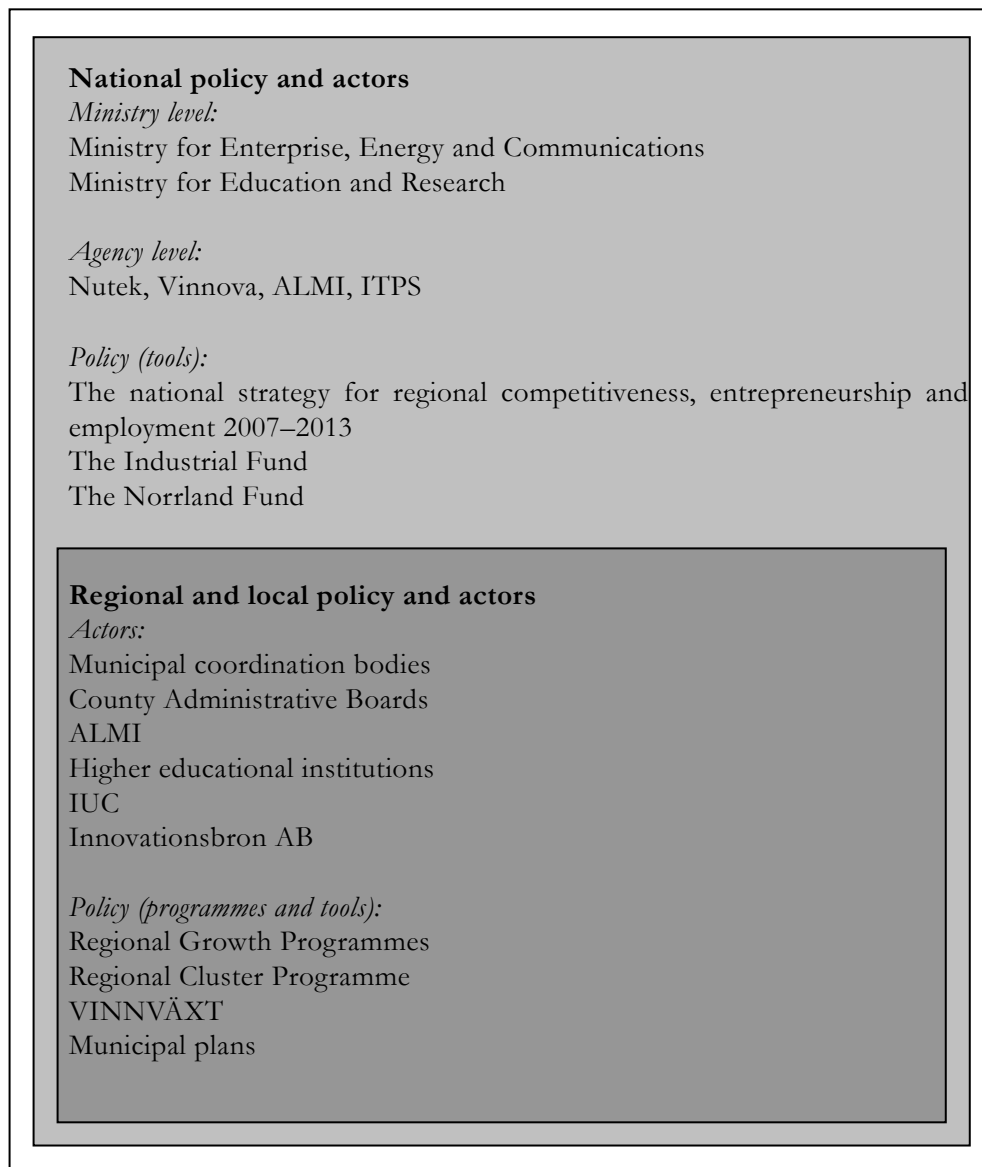


Figure 8: Organizational structure of the recent system

Nutek is in charge of a *cluster programme* running throughout the period 2005–2010. In particular, the programme finances mature cluster initiatives with a view to enhancing international competitiveness. The selection of the initiatives occurs in the context of a two step process. The first step consists of a dialogue with the regional level based on the prioritisations made in the regional growth programmes. In the second phase a dialogue with the cluster initiative based on the criteria of the programme is developed. The main idea here is to identify common needs in respect of process support, analyses, methods and the exchange of experiences, which will contribute to the development of clusters and innovation systems. A primary task in the programme is to make use of the connections between clusters and innovation systems at the regional and national level. The following activities are supported by the programme; networking between small and medium-sized companies, higher education institutions and public actors; encouraging commercial

cooperation concerning i.e. the purchase, analyses and promotion of exports and cluster expansion by attracting establishments, spin-offs, branding etc.¹⁵⁸

Industrifonden (The Industrial Fund) is designed to promote profitable industrial growth and one way of doing this is to provide financing for companies and to undertake development and marketing projects in the form of equity or loans. The activities are tailor-made according to individual company needs and are also negotiated in every individual case. The Industrial Fund is also share-owner in several venture capital companies in differing parts of Sweden.¹⁵⁹

Norrlandsfonden (The Norrland Fund) are focused on helping companies in the five northernmost counties. They offer loans for start-ups, development and expansion particularly to small and medium-sized manufacturing and service-oriented enterprises. These loans focus on aggressive investments and are future-oriented. The Norrland Fund cooperates closely with banks, ALMI, venture-capital companies, county administrations, municipal business-development offices and other institutions with the aim of developing and stimulating regional and local business life in these areas. The contribution of the Norrland Fund is often around 25 percent of the total capital base.¹⁶⁰

Role and structure of the R & D system

Sweden's governance system is well geared to producing a high level of commitment to science and research. Horizontal coordination is achieved, in part, through the Ministry of Education and Science. This Ministry assumes coordination responsibility for research across other ministries, and partly through the existence of a large number of formal and informal coordination mechanisms at the ministry and especially at the agency level providing the Ministry of Education and Science with a strong position, although it is restricted to research policy and does not include innovation policy.¹⁶¹

Sweden has long been a country that allocates a significant level of resources to research and development. One weakness in the Swedish research system remains however its poor link with innovation. This appears to be partly due to the prevailing governance structure. A valid explanation here is that Sweden has separate governance structures for science and research policy on the one hand and for industrial policy on the other. As such it is often claimed that the Swedish governance system simply lacks the coordination and integration mechanisms needed for a successful innovation policy to be carried out.¹⁶²

Since 1997 the cooperation of Sweden's higher education institutions with the community as a whole has been formally stipulated by the Higher Education Act: "The institutions of higher education shall also cooperate with the surrounding community and provide information about their activities". In addition the institutions are to develop strategies and action plans for their cooperation with the community.¹⁶³ This stipulation, set out in 1997, was a statement of the institutions' increasing importance for regional development. Moreover, the establishment of the Commission for Regional Cooperation as regards higher education is considered to be one of the most important measures undertaken at the national level following the decision on the higher education sector's so-called 'third task'. The state's strategy to boost cooperation between higher education institutions and the wider community consists in the main of financing chosen projects. According to Westlund (2004) however this is problematic for at least two reasons. Firstly, it lacks long-term perspective and secondly, economic incentives can change attitudes towards the cooperation and

¹⁵⁸ Nutek, <http://www.nutek.se/sb/d/138/a/3130>

¹⁵⁹ The Government and the Government Offices of Sweden, www.sweden.gov.se

¹⁶⁰ The Government and the Government Offices of Sweden, www.sweden.gov.se

¹⁶¹ Granat Thorslund, J; Elg, L. & Sandgren, P. (2006).

¹⁶² Granat Thorslund, J; Elg, L. & Sandgren, P. (2006).

¹⁶³ Högskoleverket (2005).

establishment and the boosting of links between, these institutions, the economy and the public sector.¹⁶⁴

The Minister of Education and Science is responsible for all higher education institutions even though its current focus primarily remains on questions concerning industrial policy. The Ministry of Education set up the Commission for Regional Cooperation in the higher education sector but otherwise it has left the institutions themselves to interpret and carry out their assigned ‘third’ task. In the industrial policy area Vinnova has become a leading actor and financier of higher education institution’s cooperation. An essential part of their support is allocated to regional innovation systems and ‘triple-helix’ projects. At the regional level an important platform for the ongoing cooperation between higher educational institutions and the surrounding community remain the Regional Development Programmes.¹⁶⁵

Public-private cooperation plays an important role in Swedish innovation policy. According to Vinnova’s definition all of the actors and stakeholders that interact to produce, disseminate and use innovations form what is called an ‘innovation system’. Innovations are thereby understood as arising in systems where the interplay between various actors and research and development processes are vital elements. The foremost working model of Vinnova is the *Triple Helix*. The agency’s role in the model is to take a holistic view, and on the basis of this view, to create the preconditions for the best possible interplay between the actors in the research, industrial and political/public sectors.¹⁶⁶

At the regional level, in respect of RGPs, we also find a strong focus on public-private partnership. The RGPs are drawn up in broad partnerships, i.e. by networks made up of various public and private actors. The task of co-ordinating the RGA/RGP processes is given to municipal coordination bodies in 16 counties and the County Administrative Boards in the remaining counties. Regions with a high degree of trust and close interaction between the business community, the employees and the public sector representatives have often undergone a more favourable development than regions where such trust and close interaction do not exist. The regional development programme should be evaluated by, and “negotiated” with, the central government before coming into realisation. The regions inevitably approach the programming process in different ways, while also interpreting the partnership idea differently, even if the central directives applied to all.

The VINNVÄXT regions display a common strategic idea within the region, namely, the existence of a strong research and innovation environment, strong regional leadership and active cooperation between research, economic life and the public sector. Each of the winners are considered to have good growth potential. The short term (2 years) effects are planned to be the establishment of strategic cooperation between research, economic life and the public sector; and the production of a workable research strategy for growth. In the long term (10 years) new knowledge and technology are to be generated; competence and experience of the commercialisation of new knowledge and technology gained; and growth within enterprises and structures for internationalisation created.¹⁶⁷

To summarise, in Sweden, a strong R&D system already exists, which has however until recently had relatively weak links to the commercialization of ideas and innovations. This has been, at least partly, due to lack of coordination between research and industrial policies. The public private partnership model is then set to be an important element in future Swedish innovation policy. It is strongly linked to Vinnova’s task and also plays an important role in the RGP processes.

¹⁶⁴ Westlund, H. (2004).

¹⁶⁵ Westlund, H. (2004)

¹⁶⁶ Vinnova, <http://www.vinnova.se/>

¹⁶⁷ Vinnova (2006).

Focus of innovation policy

Sweden is adopting a broad approach to innovation. Innovation policy, defined in the strategy “Innovative Sweden”, stressed the importance of building an innovative capacity by focusing on four priority areas: knowledge base for innovation, innovative trade and industry, innovative public investment, and innovative people. The strategy was characterized by the need for more dialogue and collaboration between relevant parties and policy areas, to jointly develop the climate for innovation in Sweden. The emphasis of the strategy made it clear that education and research policy, industrial policy, export policy, regional development policy, transport policy, IT policy, defence policy and environmental policy were some of the most important areas in an innovation policy context. As such then, developing the forms for coordination and cooperation between policy areas was to be a key task in the effort to implement the strategy.¹⁶⁸ The strategy also pointed out that as circumstances differ from place to place, it was important to take local and regional perspectives into account. In addition, active efforts were considered needed at the international level, not least in connection with the EU’s endeavours to achieve the Lisbon strategy target of making Europe the world’s most competitive economy by 2010. At the same time when the strategy emphasised the effects of globalisation it also pointed out that the significance of local and regional environments was growing, as geographical proximity is necessary for meetings and communication between people developing, conveying and using knowledge and technology.

Many of the notions found in the “Innovative Sweden” strategy can also be found in the *National strategy for regional competitiveness, entrepreneurship and employment 2007–2013*. This strategy can, indirectly at least, be seen as an innovation strategy for regional competitiveness, since some of the stated prioritisations directly relate to innovation and renewal:

“A successful interaction between research, business, the public sector and political institutions is a key requirement for effective innovative environments. Sweden’s shared bank of expertise needs to be developed and converted into new products and job opportunities. This requires commitment from a wide range of players within Swedish society.”

In the strategy a company’s capacity for innovation is considered to increase if there is an effective transfer of skills and interaction with other companies and organisations. The systemic view of innovation is also evident, since innovations are considered not to be isolated incidents. Instead, innovations emerge through collaboration with a number of players. Innovative environments are viewed as the basic requirement for innovations, innovation systems and clusters to appear, spread and develop. In the strategy the local and regional levels are given more influence on the development of innovation systems and clusters. “A region’s ability to develop innovations depends not only on how well the constituent institutions and players act, but especially on how well they interact with one another.” In addition, the interactions with other national and international actors are stressed and should be promoted as a means of developing innovative environments. The promotion of international cooperation implies that the regional innovative environments will gain access to a larger critical mass of players and skills, and thus boost their capacity for innovation.

At the regional level in Sweden, links exist between regional development policy and innovation policy.¹⁶⁹ The current regional growth policy is put into practice in the Regional Growth Programmes that also create links between the policy streams. The regional growth policy is a means of establishing and developing a coordinated policy for the whole country, which can be adapted to regional needs and conditions. Every region’s endogenous competitive advantages shall be used in the development of peripheral regions. The policy covers all parts of the Swedish territory and not only various types of less-favoured regions

¹⁶⁸ The Ministry of Industry, Employment and Communications (2004).

¹⁶⁹ Ikonen, R. & Johansson, M. (2006).

as was the case with the previous regional policy. The focus is no longer placed here on the reduction of disparities *per se* but rather on the potentials each region can offer in accordance with their own conditions to enhance national growth. The rationale for this is that a more comprehensive approach to regional policies will prevent increasing spatial dualism between different regions. The new territorial approach also implies that efforts should be made to prevent a spatial division of Sweden where bridges should be built between e.g. urban and rural areas.¹⁷⁰ In the new *Regional growth policy* it is also stated that there is a continuing need for initiatives targeting geographically defined areas that are considered to be in need of special measures to strengthen their potential for sustainable growth.

Co-ordination and regional considerations in the various national policy areas are central here and they must adapt to the varied development potentials and the diversity of structures in different parts of the Swedish territory. The fundamentals in terms of the way forward here are the need to strengthen the territorial dimension in “policy making” and to ensure that a shift occurs from a sector to a cross-sector approach (where place-based measures will take priority over sector-based measures).¹⁷¹

In the first evaluation, in 2001, it was noted that the RGAs had increased awareness of the importance of regional and local economic environments in respect of individual enterprise competitiveness. According to the Vinnova’s report, moreover, the cluster perspective has become increasingly emphasised. The RGA’s also improved coordination and knowledge in respect of existing resources.¹⁷² One of the three strategic questions in the RGP is innovation systems and clustering. The RGP is supposed to be process-oriented as compared to the RGA’s which had a rather more static approach. Learning effects have in addition become ever more pronounced. Functional regions are now emphasised in the RGP work in comparison to the RGA’s where counties were used as administrative regions.¹⁷³

The cluster approach is one of several approaches used in order to promote regional development outside the metropolitan areas. For Swedish regions to be attractive places for people and enterprises to work in, a strong knowledge-base and well-defined research-and innovation environments with well-developed international contacts are necessary. The main policy tool here is Vinnova’s “VINNVÄXT” programme. Another programme, the “Regional Cluster Programme”, was announced in late 2005 by Nutek and this focuses on international competitiveness and international market development initiatives by clusters.¹⁷⁴

In addition, Swedish rural policy also includes some elements that can be seen as contributing to innovations at the regional level, and specifically in regions outside metropolitan areas. For example the Objective 1 programmes in Sweden aimed at contributing to the development of trade and industry and to the strengthening and diversification of innovative business life.¹⁷⁵ The *Leader +* programme in Sweden aimed at, in the context of local conditions and initiatives, support for new and innovative methods for the renewal of rural areas. In the rural development programme for 2007-2013 it is noted that “realisation of the goals of the programme will necessitate a continuing high level of ambition on the environmental front combined with further initiatives focusing on the key areas identified in the Lisbon strategy”. This will primarily involve greater efforts to promote long-term, sustainable production and the use of natural resources in agriculture and forestry, a greater focus on policy contributions to growth and employment, the promotion of knowledge and skills acquisition, innovations and efforts to facilitate the transformation of energy policy.¹⁷⁶

¹⁷⁰ Government Offices of Sweden (2006).

¹⁷¹ Ikonen, R. & Johansson, M. (2006).

¹⁷² Granat Thorslund, J; Elg, L. & Sandgren, P. (2005).

¹⁷³ Nutek (2004).

¹⁷⁴ Vinnova, <http://www.vinnova.se/>

¹⁷⁵ Ikonen, R. & Johansson, M. (2006).

¹⁷⁶ Ministry of Agriculture, Food and Consumer Affairs (2006).

To summarise then, Sweden has a strong regional policy tradition stressing the importance of innovation. Several specific innovation programmes also exist with the aim of strengthening the local and regional innovation environment. Vinnova's VINNVÄXT-programme has the most direct focus on regional innovation environments. In addition, regional and rural policy seems also to have an increasing focus on innovations.

Nordic and European influences on, and connections to, the Lisbon Agenda

It is rather difficult to find direct connections between the Swedish innovation policy and the innovation policies in other countries. However, there are many common elements between the policy programmes in the Nordic countries. In particular similarities seem to exist between Norwegian policies and Finnish and Swedish experiences. Moreover, Swedish innovation policy, regional growth policy and the Lisbon Strategy are all directly interconnected. The "Innovative Sweden" policy was adopted as a framework for developing policies in line with the Lisbon strategy. The vision was closely related to goals in the strategy.¹⁷⁷ This strategy was however abolished after the change of government in autumn 2006. The document *National strategy for regional competitiveness, entrepreneurship and employment 2007–2013* includes elements that are in line with achieving the Lisbon objectives. According to the Swedish Reform Programme for Growth and Employment the strategic instruments for regional development at the regional level are the regional development programmes where regional priorities for sustainable development taken from a 'broad perspective' view are identified by the regions. The priorities correspond well with the Lisbon agenda and are carried out through the regional growth programmes. A number of municipalities have, on a voluntary basis, launched a process to prepare local initiatives for growth and employment in line with the integrated guidelines and the Lisbon targets.

Future perspectives

Several of the Swedish programmes promoting innovation have already been evaluated. Among others, in 2006, a mid-term evaluation of the RGPs was made. The mid-term evaluation indicates that the degree of growth orientation is higher and more focused now than during the Regional Growth Agreement (RGA) period. This, though, was manifested more clearly in the programmes than in actual implementation. The majority of actors at the regional and local levels feel that RDPs deliver considerable benefits and that their objectives have become more concrete. Their growth targets are now expressed more clearly than in the RGAs and learning is seen as an accepted part of the process-oriented mode of operation.¹⁷⁸

According to the evaluation the directives from the central level, above all in respect of the role of government agencies within the framework of the RGPs, are unclear, which complicates vertical sectoral coordination – the directives on participation within the framework of the RGPs should then be as clearly defined as the sectoral assignments.

At the regional level wide variations seem to remain over how RGPs are implemented in the different counties. As such, the evaluation recommends that the knowledge possessed by users, researchers and evaluators in respect of what constitutes an effective learning process should be further disseminated.

The mid-term evaluation, as with the earlier evaluations, highlights the need to get the enterprise sector more involved in the RGPs. One way to improve the situation would be to market RGPs, showing how enterprises can benefit in a concrete way from such

¹⁷⁷ Granat Thorslund, J; Elg, L. & Sandgren, P. (2006).

¹⁷⁸ ITPS (2006).

programmes. Another way would be to offer enterprises some form of financial support for participation.

The report “*Erfarenheter och lärdomar från Vinnovas programme VINNVÄXT*” was undertaken as an assignment tendered by *Visanu*, the national programme for development of innovation systems and clusters run cooperatively by ISA, Nutek and Vinnova during the period 2002-2004. The report is not an evaluation *per se* but an analysis of the programme itself. The positive results, highlighted in the report, included the programme’s long term perspective (10 years), the fact that the programme has made it easier for regional actors to prioritise and also that the programme, to some extent, helped the regions to “kick start” potential development initiatives. Better coordination and the creation of organisations of ‘prime movers’ and the introduction of actors with different motives and objectives into the system seem to be other positive by products of the programme. It was also seen as positive that VINNVÄXT focuses on the *process* rather than on actually *creating* formal organisations. Triple Helix cooperation is considered broader and less traditional here in the sense that new types of actors have found new ways to participate.

The programme has lead to a number of new ideas being presented while also helping to give structure to them. Criticism is directed towards the practical implementation and construction of the programme. Some results have indicated that the supposed dialogue between the regional initiatives and Vinnova was sometimes more of a ‘one-way-communication’. Some felt also that Vinnova did not have enough detailed knowledge concerning the initiative under scrutiny. Some initiatives saw the risk of ‘regional myopia’, i.e. regional delimitations do not necessarily favour the development of the particular innovation system in the long run. In such cases relations to strategic actors outside the region, e.g. international research *milieus*, may need to be cultivated.

Currents efforts to increase innovations seem to be rather successful. However several difficult challenges are still faced. Globalisation has had a significant impact on Sweden a country that has traditionally been dependent on a few large enterprises. Vinnova’s report (*En lärande innovationspolitik – samordning och samverkan*) states that this creates a new challenge for the country. Even if these enterprises remain successful, this does not necessarily result in an expanding labour market since they operate relatively mature branches where rationalisation is an important tool of profitability. Therefore the challenge here is to create the prerequisites for the putting in place of a truly ‘entrepreneurial culture’ designed to contribute to a rise in the number of new and expanding enterprises. This is considered to require a much broader, systemic innovation policy approach. Some steps in this direction have already been taken by creating Vinnova and drafting the national strategy for regional competitiveness, entrepreneurship and employment 2007-2013 as well as the six sectoral industrial strategies. In autumn 2008 the government also intends to present a new research policy bill that, among other things, will address head on the issue of innovation. Innovation is seen clearly to be an issue of rising importance on the political agenda, while an innovation systems’ view is undoubtedly taking hold, although difficulties remain over what is meant by the notion of innovation in practice.¹⁷⁹

¹⁷⁹ Granat Thorslund, J; Elg, L. & Sandgren, P. (2006).

Triple Steelix – A Vinnväxt project

Introduction

Vinnova's (Swedish Governmental Agency for Innovation Systems) VINNVÄXT programme ("Regional growth through dynamic innovation systems") was the first one in Sweden with a regional perspective on innovation. VINNVÄXT differs from previous initiatives in Sweden due to its long-term perspective, its process support and the fact that the programme selection procedure is competitive. The programme's biggest achievement is the concentration of efforts around a strategic idea in a region. During the years that VINNVÄXT has existed, a number of processes for developing dynamic innovation systems have been initiated. One of these is the Triple Steelix (System for innovation in relation to advanced steel products and applications) in Bergslagen region. In this project, through wide-ranging co-operation within different applications and customer segments for advanced steel products, R&D work is said to have been revived and new networks established. *"By bringing out new advanced technical solutions, the value of the steel can be further increased and the degree of refinement can be raised, thus creating new business".*¹⁸⁰ The geographical focus of the programme and the competitive project selection process also makes the project interesting as a case study. The steel industry is a traditional sector and important both nationally, and regionally, in Bergslagen. The region is located outside the metropolitan areas and consists of rather peripheral areas although the regional centres such as Borlänge and Falun each have growing populations.

Instrument in the national context

Governance structure of the instrument

The VINNVÄXT programme is run by Vinnova. It aims to promote growth and international competitiveness within the functional growth areas through problem-oriented research and development of innovation systems to internationally competitive levels. At a project level the programme is designed to support the concrete development of effective innovation systems in clearly defined functional regions. As such, the programme has a direct focus on regional innovations and clustering. The goal here is *"to promote sustainable growth in the regions based on internationally competitive ability, by successively developing or further developing the functioning, dynamics and effectiveness of innovation systems in functional regions at international level."* Moreover, in these regions the aim is to make an impact at the policy level, for example by influencing regional business policy, changes in development strategies for research and development organisations and new forms of cooperation between business, research/development and society.¹⁸¹

The VINNVÄXT programme was planned during 2001. The planning phase consisted of the implementation of five pilot projects, each with a different focus and in regions with different conditions. During the preparation, studies of foreign programmes of a similar type in several countries were also made. Thus the important factors for regional growth on the basis of experiences within Sweden and abroad were identified. The programme was designed on the basis of the information and insights gained from these planning elements, together with the knowledge and experience of the project groups.¹⁸²

¹⁸⁰ Vinnova, www.vinnova.se

¹⁸¹ Programme description

¹⁸² Programme description.

The central elements of the VINNVÄXT programme

The programme is based on two central phases:

- A “call for proposals” phase
- A number of support activities of which some are linked in the short term to the call process and others have the long-term aim of developing sound regional competitiveness at an international level (Programme description)

In the “*call for proposals*” phase successful applications receive financial and practical support. This process implies that funds are being allocated to the projects with the most potential. These projects are selected on the basis of a competitive evaluation of the project proposals.

The support activities are divided into programme launch, process support activities and activities that aim at the development of an active learning process within the programme.

Programme launch:

- publish and communicate the concept and the ideas behind the programme in such a way that there is a possibility of receiving a larger number of suitable proposals
- develop a high-quality marketing and communications strategy
- coordinate the schedules for advertising and for the submission of proposals

Process support activities:

- ensure that analysis support is available which complements and supports regional and local skills
- ensure that process support is available which complements and supports regional and local skills
- organise training and certification of innovation system developers

Develop an active learning process within the programme by:

- contributing to the coordination of development strategies between the different functional regions and at a national level through joint dialogue, where this is deemed necessary and justified
- showing active commitment and participation in the selected projects
- organising ongoing assessment and tracking. (Programme description)

These experiences have shown that process support is a key factor in success. This became evident in relation to international benchmarking both in terms of the research and in the five pilot projects. Examples of support activities include seminars for communicating concepts and ideas; analysis and process support for project planning and implementation; active learning i.e. ongoing tracking and assessment and the active exchange of experiences through participation in forums. The function of process support is outsourced to the Dahmén Institute, a network organization working towards better knowledge levels in respect of the development of Swedish innovation policies, as well as the promotion of Sweden’s regional and national economic growth.¹⁸³

The VINNVÄXT programme was the first programme of its kind in Sweden. Implementation of the VINNVÄXT programme began in 2002. About 70 initiatives sought financing in the two calls (2003 and 2004) and eight regions have won in the “VINNVÄXT competition”. A third VINNVÄXT call was launched in 2005. Five regions were chosen to receive planning support within this call, and a maximum of two will be chosen as VINNVÄXT regions in 2008.¹⁸⁴

¹⁸³ Christensen, L.

¹⁸⁴ Vinnova, www.vinnova.se

The VINNVÄXT regions have had a common strategic idea, a strong research and innovation environment, strong regional leadership and active cooperation between research, economic life and the public sector. Each of the winners is considered to have good growth potential. The short term effect (2 years) is envisaged as the establishment of strategic cooperation between research, economic life and the public sector; and the putting in place of a research strategy for growth. In the long term perspective (10 years), new knowledge and technology are to be generated, while competence and experience of the commercialisation of new knowledge and technology are to be gained. In addition, growth within enterprises and structures for internationalisation is also to be created.¹⁸⁵

Key actors

Vinnova finances the VINNVÄXT programme. It provides the “winner regions” with funds of up to 1.1 million euro per year for a period of 10 years. The regions must contribute with at least the same amount themselves. Moreover, Vinnova organises courses and seminars for the programme participants. The selected regions are also offered so-called process support in the form of seminars, coaching, follow-up and the exchange of experience. They will be evaluated every third year in order to determine whether they are complying with the demands set by Vinnova.¹⁸⁶ The actors, implementing the instrument within the national/regional innovation systems include a wide variety of public and private actors at the national, regional and local levels.

Cooperation between actors at different levels

A prerequisite of the programme is the active participation of actors from the business community, research organisations, politics and public administration. Importantly this participation is based on the *triple helix* approach in which innovations are expected to take place within the three overlapping helixes: industry, research and society. One long-term (12 year) objective of the programme is increased cooperation between actors in the triple helix. Moreover companies are encouraged to increase their cooperation with other companies and with other important players.¹⁸⁷ Thus both public-private and private-private cooperation are encouraged by the programme.

Role of the instrument in “regional innovation policy”

The programme is expected to make an effective contribution to the improvement of skills across all regions, to the development of the operational skills necessary to work with region's leadership and to the promotion of innovation systems. Here a connection to the other regional and innovation policy instruments is also made. According to the programme description the significant factors at a policy level include ensuring that action (not only planning) takes place within the region. However, many previous initiatives have not progressed beyond the planning stage. Moreover the significant factors include gaining experience of, and testing, this method of working in the light of new programmes, for example the new regional growth programme.¹⁸⁸

The VINNVÄXT projects are financed by the county administrative boards responsible for the RGPs (Regional Growth Programmes) and RDPs (Regional Development Programmes). Thus the projects are also, in practice, closely linked to these regional development programmes. The regional growth programmes (RGPs) connect the VINNVÄXT programme to general regional policy. Moreover the EU Structural Funds have been important in financing the VINNVÄXT projects. In the future, the connection with the EU Structural Funds is expected to become even stronger, as innovation and the innovation environment are mentioned in the new programmes and are thus seen as a priority.

¹⁸⁵ Programme description.

¹⁸⁶ Vinnova Information VI 2006:15.

¹⁸⁷ Programme description.

¹⁸⁸ Programme description.

In Sweden, there are many other programmes strengthening growth and international competitiveness such as Nutek's cluster programme. VINNVÄXT differs from these by having a long-term perspective and more economic resources. Other efforts have only a 1-3 year perspective, e.g. the cluster programme that Nutek runs. Another difference between Vinnova's and Nutek's efforts is that the VINNVÄXT programme focuses on research whereas Nutek's programme emphasises business and enterprise development.¹⁸⁹

The Vinnväxt-programme took its inspiration from the similar programmes in several countries, e.g. Germany, England, the USA, New Zealand, Norway, Finland and Canada. According to the programme description the structure of the evaluation process of the project applications took its inspiration from an English programme, the Finnish CoE (Centres of Expertise) and the German Innoreg programme.¹⁹⁰ The programme was however particularly inspired by the Norwegian REGINN programme in the development phase. During the implementation phase cooperation also occurred with the Norwegian ARENA programme.¹⁹¹ The experience of the Norwegian REGINN programme indicated the importance of including both strategic and practical activities in regional projects.

*The strategic level covers all areas of the triple helix and focuses on providing support for the activities which will develop the players' ability to cooperate and complement each other, thereby strengthening the entire innovation system. A subset of the players in the innovation system is generally involved in the practical activities, which usually consist of projects with practical problem-solving or direct business objectives. These projects are important because they produce practical results, but also because they build up the players' confidence in each other, which forms a solid base for more strategic activities.*¹⁹²

According to a study undertaken by the ISA (2005), the major positive aspects of the VINNVÄXT-programme are that it is a long term initiative; that VINNVÄXT has made it easier for regional actors to prioritize and that the programme has, to some extent, helped the regions to 'kick start' potential development initiatives. Moreover, better coordination, the organization of 'prime movers' and the participation of actors with different motives and objectives are other positive effects of the programme. VINNVÄXT has also been about focusing on the process rather than creating formal organizations. Triple Helix co-operation is viewed as broader and less traditional, in the sense that new types of actors have found new ways to participate while the programme has created regional and national credibility for the sectors (i.e. the regional development initiatives) involved.

The programme addresses the Lisbon goals in its own way to increase employment. It is also built on a so called "strategic idea" in a region and aims to improve regional attractiveness.

Focus of the instrument

Main concrete components of the instrument

The eight current VINNVÄXT regions share a number of common features. For example, the regional actors share the same strategic objective, there is a strong research and innovation environment and strong regional leadership while active participation exists on the part of the research, the private and the public sectors. Each of the regions involved is believed to have excellent growth potential. The objective here is that the winners will become internationally competitive in their respective fields within 10 years. The fields that these regions represent include: IT, biotechnology, the healthcare sector, fibre optics, the steel industry sector, robotics, and the food industry.¹⁹³

¹⁸⁹ Lars-Gunnar Larsson.

¹⁹⁰ Programme description, p. 14.

¹⁹¹ Lars-Gunnar Larsson.

¹⁹² Programme description, p. 11.

¹⁹³ Vinnova Information VI 2006:15.

Innovation approach

The VINNVÄXT programme uses the triple helix concept as a model for the development of interaction and learning in a regional innovation system. In this model the different actors, including businesses, R&D organisations, politicians and public authorities overlap and interact. Thus the motivation behind the VINNVÄXT programme is that innovation takes place within the framework of complex processes as a result of a variety of actors learning from and interacting with one another. Moreover it is based on the idea that both experience and research show that geographic proximity can produce competitive advantages based on unique types of research, development and business cooperation, together with learning and skills. According to the programme description, regions which have an understanding of this, of their own business, research and educational organisations and of their political and public bodies will be able to cooperate and coordinate their resources effectively (as in the triple helix). They will also be able to consciously develop their competitive advantages and promote regeneration and innovation capabilities which will lead to new growth.¹⁹⁴

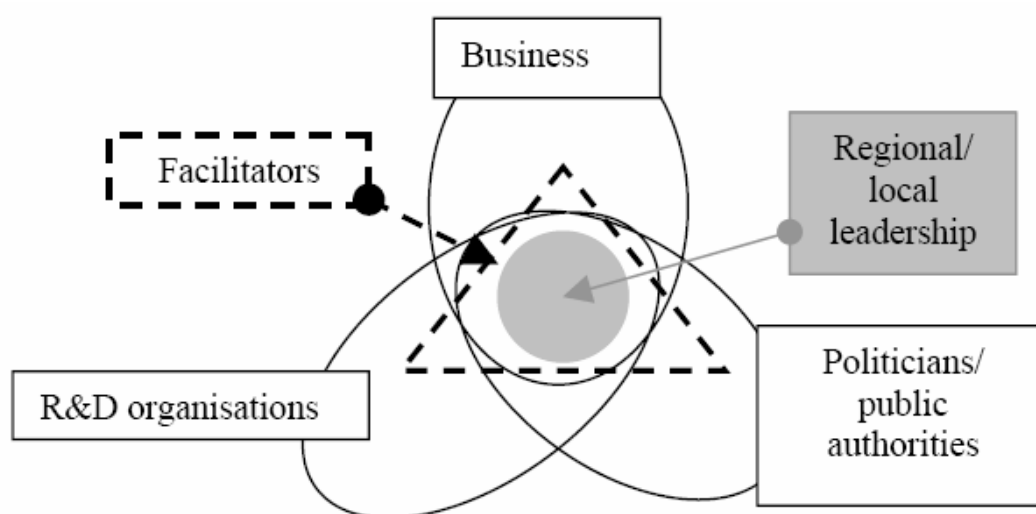


Figure 9: Triple helix model. (Source: Programme description p 10)

Geographical approach

VINNVÄXT is a regional dimension of an innovation policy instrument. The various VINNVÄXT projects have different regional contexts and conditions as well as representing different branches. *“The concept of a “region” is defined in the programme primarily in functional terms as the groups/coalitions/partnerships applying to the programme and the location of their core competencies and supporting (business, technological etc.) activities. The traditional administrative regions which become involved (districts and counties) and which become important players is dependent on these locations.”*¹⁹⁵

The VINNVÄXT programme was considered necessary for regions with special potential whereas efforts within the regional RGPs (the most important instruments in the regional policy context) are allocated to all parts of regions. VINNVÄXT was considered necessary in addition to regional development programmes as a national instrument. The programme has an “elitist” perspective in the sense that it is focussed on those regions that are already thriving within a certain economic sector and are expected to become even better.¹⁹⁶

The programme is based on a competitive selection of project applications where the most promising and internationally competitive regions receive long-term financing. Thus the programme is meant to profile (focus) those regions that are successful within a certain industry sector. This approach has led to the reality that support is mostly directed to already

¹⁹⁴ Programme description, p. 4.

¹⁹⁵ Programme description, p. 4.

¹⁹⁶ Lars-Gunnar Larsson.

strong regions and regional centres. The programme has no focus on a region's growth potential as a whole or any consideration of regional differences/peripheral regions within the chosen region. Vinnova's focus is on research and the authority has no regional development task. It takes, moreover, a national view on growth. Therefore it chooses the regions that have the best potential nationally and not those regions that have problems.¹⁹⁷ The programme however indirectly contributes, in the national context, to some geographically peripheral regions that are especially successful within a certain branch.

Application of the Vinnväxt project Triple Steelix in the regional case context of Bergslagen

The regional context of Bergslagen

The Triple Steelix project covers Bergslagen region which is a functional region that has no formal administrative borders. The region has traditionally been a mining district and is a historically, culturally, and linguistically distinct region of Svealand in central Sweden. Mining and the metallurgic industries have been important for the region since the middle ages. The geographical area of Bergslagen covers part of the counties of Västmanland, Gävleborg, Dalarna, Örebro and Värmland (see Appendix). The area is very rich in minerals. Mining has focused on iron ore extraction for centuries but other ores have also been mined. Most mines operating in the 1970s are however now closed. Today the steel industry in Bergslagen is internationally unique and has 0.4 % of the world's steel production. The industry is a world leader with a number of knowledge intensive steel products.¹⁹⁸

The functional region that Triple Steelix covers, consists of a part of Bergslagen that has strong and multiple steel and engineering industries. During the development process parts of this region have grown into the geographical core of eight municipalities within three different counties, Västmanland, Dalarna and Gävleborg. This geographical limitation does not, however, mean that enterprises outside this region are excluded from the VINNVÄXT process.¹⁹⁹ This is considered as a positive aspect that has led to new cooperation possibilities and completely new constellations of actors generating new ways of thinking and new exchanges of experience.

¹⁹⁷ Lars-Gunnar Larsson.

¹⁹⁸ Triple Steelix ansökning.

¹⁹⁹ Triple Steelix ansökning.

Table 5: Fact sheet about the Bergslagen region

	Dalarna County	Gävleborg County	Västmanland County
Area	28,193 km ²	18,192 km ²	5,132 km ²
Inhabitants	275,755 (2006)	275,994 (2006)	247,757 (2006) (of the national population)
Population density	10 inhabitants /km ² (national average 22)	15 inhabitants /km ² (national average 22)	48 inhabitants /km ² (national average 22)
Population structure (2005)			
0-14	16 % (national average 17 %)	16 % (national average 17 %)	17 % (national average 17 %)
15-64	64 % (national average 65 %)	64 % (national average 65 %)	65 % (national average 65 %)
65+	20 % (national average 17 %)	20 % (national average 17 %)	18 % (national average 17 %)
Population change 2002-2005 Relative annual average	-1.1 promille (national average 3.9 promille)	-1.9 promille (national average 3.9 promille)	-0.1 promille (national average 3.9 promille)
Number of persons employed (2005)	124,517	120,565	108,087
Employment rate (2005)	72.9 % (national average 73.3 %)	69.3 % (national average 73.3 %)	74.5 % (national average 73.3 %)
Unemployment rate (2005)	8,0 % (national average 7.3 %)	10,9 % (national average 7.3 %)	7.6 % (national average 7.3 %)

Source: Neubauer, J. *et al* (2007).

Governance structure of the instrument

Brief background to the development of Triple Steelix

The overall aim of the *Triple Steelix* is to develop the steel branch and infrastructure in order for it to become a world leading steel region. Industry, society and the citizens more generally, will be the winners here by fulfilling this goal. The strategic idea is based on the close cooperation between industry, society and the research community designed to create a dynamic innovation system that creates new enterprises and improves existing enterprises. The project will support small and medium-sized companies by creating direct accessibility to the broad knowledge-base of steel and steel processing contained within the region. One possibility for researchers here is to test new ideas and help in developing business strategy, production and marketing. Triple Steelix will thereby contribute to the growth of enterprises and economic growth. This encompasses the creation of competitive enterprises and more secure jobs, long-term research efforts and technical development. Moreover it also aims at the creation of attractive workplaces both for men and women.²⁰⁰

²⁰⁰ Triple Steelix, <http://www.triplesteelix.se>

The Rostfritt project, started in 1999, was designed to support small enterprises' competence development processes such that they can better utilise the potentials of rust-free material. Importantly small enterprises were encouraged to contact *AvestaPolarits*' R&D division. The overall aim of the project was to increase the use and knowledge of rust-free material. The project was to develop *AvestaPolarits* R&D division so that it would become more readily available to the needs of small and medium-sized enterprises and in general improve technical skills in the region's enterprises. The project was implemented because significant knowledge already existed in the region concerning rust-free material while only a few enterprises had significant processing of rust-free products. Participating enterprises could receive help in technical analysis and/or in the product and marketing development areas within the context of the project. The project was financed by IUC Dalarna, *AvestaPolarit*, Avesta municipality, Hedemora municipality, Länsstyrelsen Dalarna, Stiftelsen *Svensk Industridesign* and EU's objective 2. The project was concluded at the end of 2003 resulting in some new enterprises and several development projects such as Triple Steelix. (www.iucdalarna.se.)

The network Tunnplåt is a coalition of about 25 small and medium-sized enterprises working with thin plate processing. Every enterprise has its own expertise and by cooperating these enterprises gain significant advantages (<http://www.natverktunnplat.com/>). The number of enterprises in this cooperation field has constantly grown and it has been considered as a successful example of regional branch development. This project, started in 1999, has also received EU structural funds and has been supported by SSAB Tunnplätt, Högskolan Dalarna and IUC Dalarna in addition to *Triple Steelix* (*Nätverk tunnplätt – Nyhetsbrev 3*).

The project submitted an application to the Vinnväxt-programme in 2002 but only received financing within the second VINNVÄXT call in 2004. The project received planning support (*utvecklingsanslag*) for 1.5 million SEK from Vinnova a year before. This support made it possible to improve the application and expand the project by 11 million SEK including financing from eight municipalities, three county administrative boards, Region Dalarna, private enterprise and the universities.²⁰¹ The planning support is considered very important for the project. It helped to anchor the project and gain additional financing and legitimacy from the stakeholders. *Jernkontoret*, the branch organisation for the steel industry, stood behind the idea of the project together with some local actors and heads of business development in the municipalities.²⁰² The fact that *Jernkontoret* is the project manager meant increased legitimacy for the project as well as better accessibility to the big companies²⁰³. Involving the big companies was however a prerequisite for the project that has its main focus on the small and medium-sized companies, namely, the sub-contractors that have grown up around the big companies.

Already before the application smaller networks and projects had been created in the region. The region had e.g. organised networks between several enterprises within the material processing sector. In addition a number of other services enterprises existed within technical assessment; testing, IT and the environment had also developed from the needs of the steel industry. The Rostfritt project and Network Tunnplåt (see text box) provide examples of the important previous networks and organisations that Triple Steelix could build on. These were used as a platform in the development of the application.

According to Maria Engholm VINNVÄXT in Bergslagen is particularly needed for two reasons: growth and attractiveness. To increase growth within small and medium-sized companies, a more differentiated industry within the branch is to be created. Secondly there remains a need to create a more attractive environment for the workforce, enabling them to

²⁰¹ Triple Steelix ansökning

²⁰² Lars Hansson

²⁰³ Maria Engholm

become more mobile and more willing to change workplaces and work tasks. Triple Steelix concentrates to a large extent on enterprises and ideas that have already come far in their technical development and therefore have a significant potential for growth. Some important development and research fields have already been identified. An important and growing part of Triple Steelix is to strengthen the increasing number of service enterprises that are connected to steel industry, e.g. within IT process control and technology for environmental measures.²⁰⁴

Key actors

The actors, implementing the instrument within the national and regional innovation systems, include a wide variety of public and private actors at the national, regional and local levels. *Jernkontoret* – the Swedish Steel Producers' Association is the manager of the project at the regional level. The steel producers in *Triple Steelix* comprise *Fagersta Stainless*, *Outokumpu Stainless*, *SSAB Tunnplåt* and *Sandvik Materials Technology*. Other actors include the *Stiftelsen Teknikdalen i Borlänge* and IUC Dalarna. The research sector is represented by *Högskolan Dalarna och Högskolan i Gävle/Sandviken*. Society as a whole is represented by eight municipalities and county administrative boards of Dalarna, Gävleborg and Västmanland.²⁰⁵

Triple Steelix has four fields of operation: Sheet steel, Stainless steel, Machining, and Services & Service. All the operation fields are independent and have responsibility for the *Triple Steelix* project within their respective field. Overall responsibility for the whole *Triple Steelix* project belongs to the board that consists of representatives of industry, society and research in the region. Process management at the regional level with a process leader composes the executive leadership for *Triple Steelix*. The process leaders have a reference group with a number of experts within different fields, e.g. steel processing, business development and information and marketing questions. These persons divide their time between *Triple Steelix* and work in different enterprises, research institutes and municipalities and county administrative boards.²⁰⁶

Vinnova has disbursed 60 million SEK over ten years. The project initiators (municipalities, private enterprises, and educational institutes) will invest at least the same amount of money in the form of financial and personnel resources within the coming ten years. The EU has also granted support for the project. Overall basic financing within the ten years is 160 millions SEK. Additional resources will come in the form of project and cooperation. All big steel producers in the region are among the initiators. Around 200 small and medium-sized enterprises, which in some way or another have a connection to the steel industry, participate in the project's activities in various ways.²⁰⁷

²⁰⁴ Triple Steelix, <http://www.triplesteelix.se>

²⁰⁵ Triple Steelix, <http://www.triplesteelix.se>

²⁰⁶ Triple Steelix, <http://www.triplesteelix.se>

²⁰⁷ Triple Steelix, <http://www.triplesteelix.se>

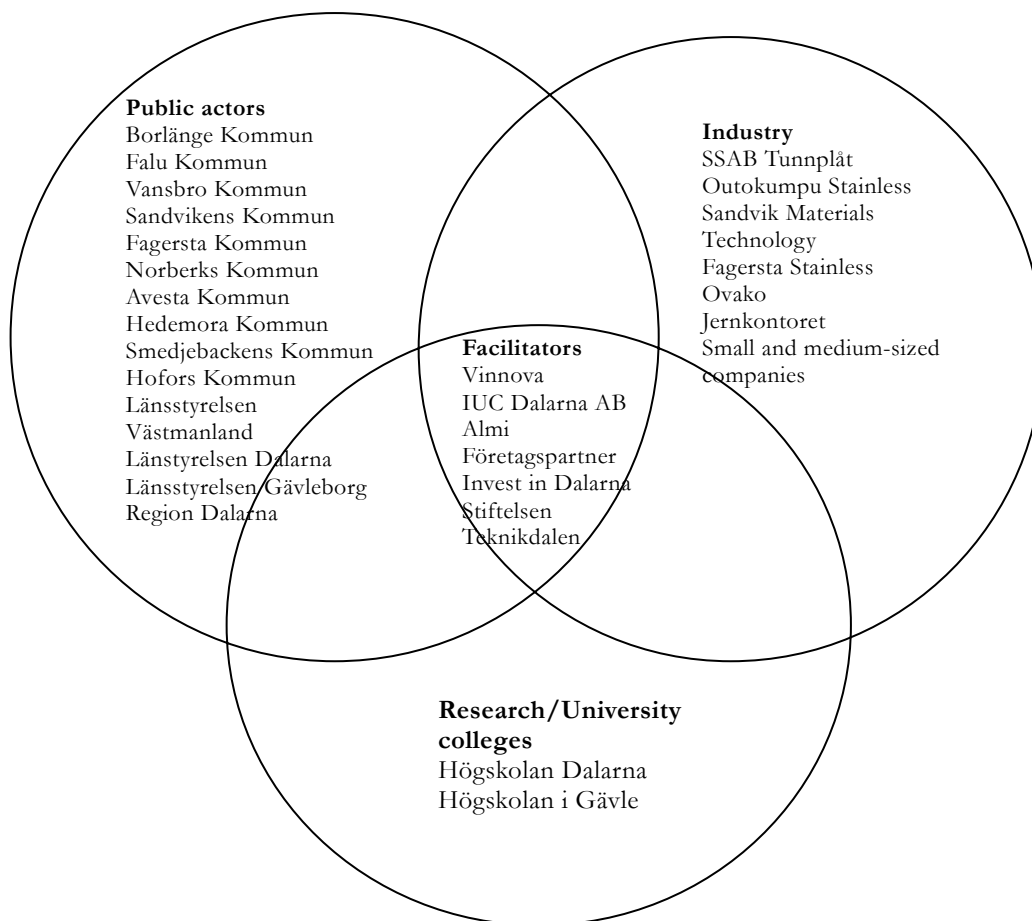


Figure 10: Triple Steelix actors

Cooperation between actors

Triple Steelix is linked both to the EU Structural Funds and to the regional development programmes. The project is viewed as an integral part of regional growth policy and as a development force for industry. It is regarded as highly beneficial compared to the more “bureaucratic” EU Structural Funds that are implemented in less strategic short term projects and which often lack continual financial commitment.²⁰⁸ From the beginning of the process the relationship between the local public authorities has been closer than that with the regional authorities. The local municipal actors have been actively involved in the process from the beginning while the regional actors at the county administrative boards and the federation of municipalities (Region Dalarna) only became involved rather later. Cooperation with the regional actors is however expected to be tightened and the project will probably play a more important role in the RGP in the future. The needs of the small and medium-sized companies are the priority of the project. Enterprises can become a part of the cooperation initiative even though the municipality would not be a partner in *Triple Steelix*.²⁰⁹

Triple Steelix is based on a triple helix working method that stimulates development and growth. This is described as a goal-directed and non-bureaucratic cooperative venture between private enterprises, authorities and researchers where it is possible to quickly create, test and realise new ideas. *Triple Steelix* is expected to create a network and raise competence development in relation to steel that can help contribute to the promotion of stable and successful enterprises in the region.²¹⁰

²⁰⁸ Jan Messing

²⁰⁹ Lennart Färje

²¹⁰ Triple Steelix, <http://www.triplesteelix.se>

According to the *Triple Steelix* yearly report for 2006 the project increasingly regards companies in the steel industry as a platform for development and cooperation. Therefore it is extremely important for the employees of *Triple Steelix* to work actively with external activities and visit other companies. The involvement and participation of large companies is of significant importance to *Triple Steelix* because they can provide legitimacy and create confidence. These large companies have significant competence and knowledge that can be used in the project. They also receive something in return since the labour market in the region is developing and is becoming more differentiated. This is regarded as a prerequisite for the region in order to be able to recruit competent manpower, and the company structure increases the mobility of labour between the various companies in the region.²¹¹

Triple Steelix has also received increasing interest from new actors in terms of becoming partners in this cooperation venture. During 2007, three new municipalities are expected to join as partners as local companies wish them to do so. Therefore the model of first being able to offer the right tools, competence and network to new companies appears to have been successful. Moreover, the cooperation venture and ongoing relations with the universities in the region have been strengthened through a number of joint projects and development work in working groups. Universities have exceptionally high competence levels in areas of particular interest to the steel and engineering industries. The fact that that competence is made available and is in demand by the small and medium-sized enterprises in the region strengthens the growth potential of the companies and the 'third task' of the universities.²¹² The VINNVÄXT programme focuses in particular on research and strengthening cooperation between the research and industrial sectors. This has been performed in the *Triple Steelix* context by bringing research to the enterprises in those sectors where they often have previously had only limited contact.

The public sector provides good conditions for industry to function by creating financing and locational opportunities and an attractive environment for new and existing residents in Bergslagen. Important private-private partnerships exist between the small and large companies where the small enterprises act as subcontractors to the larger enterprises or where the larger enterprises' R&D divisions are utilized by the small enterprises. Most central for the cooperation envisaged here are the needs of the small and medium-sized companies.

The existence of a robust learning process is very important for the educational institutes, in order for them to be able to respond to industry's needs concerning labour force and R&D issues. *Triple Steelix* is designed to function as a platform for different partnerships enabling these actors to find each other and to solve common problems. There are also other important industrial clusters in the region such as tourism and the forestry industry but they are not as strong as the steel cluster. Indirectly however *Triple Steelix* can also help to strengthen these clusters.²¹³ *Triple Steelix* does not have a direct focus on the globally competitive big steel companies in Bergslagen. The idea here is to create as much as possible around these companies and the potential they have for the region. Thus the participation of the wide range of subcontractors in this area is central to the success of the project. The variety of enterprises is also widening as the most recent focus areas in *Triple Steelix* are the service enterprises.

Connection between Triple Steelix and other regional/local programmes and strategies

The *Triple Steelix* project receives funding from the EU structural programmes. Indirectly the project receives funds also from Nutek, which supports e.g. the Resource Centre for Women (*kvinnliga resurscentra*). The project is also linked to the regional development programmes

²¹¹ Triple Steelix. Årsrapport (2006).

²¹² Triple Steelix. Årsrapport (2006).

²¹³ Maria Engholm

(RGPs). These programmes fall under the responsibility of the county administrative boards which also finance *Triple Steelix*.²¹⁴

If compared to the other instruments and strategies such as the EU Structural Funds, it is clear that *Triple Steelix* retains a more concrete idea about what makes a regional innovation system while also pursuing a long term perspective. The ‘triple helix’ model and the idea of building well-functioning regional innovation systems in the long-term are clear objectives of the VINNVÄXT programme. This differs from traditional industrial promoting and e.g. Nutek’s cluster programme which focuses more exclusively on companies and clearly limited industry clusters. In respect of the EU Structural Funds, it is not as strategic which projects are chosen and often the timeframe is too short to attain real results. Thus the VINNVÄXT perspective is more sustainable. The basic idea of VINNVÄXT is to promote the existing strength areas and create more growth and enterprises around the existing branch in the region.²¹⁵

Focus of the instrument

Usage and development of the main concrete components of the Vinnväxt programme

Triple Steelix supports the branch in many different ways and has about 10 of its own projects. Women have also become an important issue in creating an attractive region (K2 project). Vinnova considers this question as being crucial for growth in order to get the greatest use out of existing regional resources.²¹⁶ The K2 project aims to promote women’s competence within the steel and engineering branch by increasing gender equality both in big steel producers and in all small enterprises that work within, or are related to, the steel branch. It highlights women in different ways and supports enterprises in the creation of more equal working places. The work is carried out by supporting enterprises in drafting an equality plan and the K2 project also offers advice for equality work and the recruitment of women.²¹⁷

In recent years *Triple Steelix* has focused increasingly on growth and employment and goal focusing. After the initial years, 2004-2005, the project has attained legitimacy and has progressed onto the more operative phase including the promotion of the projects themselves. It is only now then that the questions over “what” and “how” are receiving increasing interest.²¹⁸ This can be related to the fact that the VINNVÄXT-programme and *Triple Steelix* are considered to be part of a wider learning process. *Triple Steelix* is a ten year project, and the long-term perspective is also the aspect that makes the project unique. Increasing goal focusing in the project is considered important in the future. It is important to bear in mind here that the broader goals of the project concern the development of an innovation system, something which does not mean the same as simple “industrial promotion”.²¹⁹

The actors involved in the project clearly considered it to be a learning process and a process that has different needs at different phases. This has appeared e.g. as personnel changes. For example when the project was transforming from the planning phase to an operational phase there was a change in project leader due to the changes in needs involved. The learning process is supported by the follow-up research, evaluation and process support offered by the *Dahmén Institute*. The Institute works in many different ways to support the VINNVÄXT programme. To provide process support it works with indicators from the project management perspective and models for project development.²²⁰

²¹⁴ Lars-Gunnar Larsson

²¹⁵ Lars Hansson

²¹⁶ Lars-Gunnar Larsson

²¹⁷ Triple Steelix, <http://www.triplesteelix.se>

²¹⁸ Messing (2006b).

²¹⁹ Jan Messing

²²⁰ www.dahmeninstitutet.se

Vinnova demands that the allocated money used be also on follow-up research, foresight processes for the projects as well as evaluations which are to be made every third year.²²¹ The two innovation development tools used during 2006 in *Triple Steelix* were follow-up research and foresight. Follow-up research has investigated the *Triple Steelix* status and the efficiency of the cooperating parties. Moreover, an analysis was conducted of the companies that were active in *Triple Steelix*. Their turnover, product range, etc., were then compiled in a manner that assists *Triple Steelix* in prioritizing the right input for the right company.²²² This study will be made annually in order to study the development of the companies in the *Triple Steelix* geographical region. According to the yearly report 2006, in the foresight work, a large number of interviews with service companies have laid the groundwork for selecting five areas that are particularly interesting to examine, in order to develop and supplement the 'Services & Service' offerings in the Bergslagen region. The scenarios in the five areas were presented by describing the intended situation by 2025 and then discussing in seminar form how this could be achieved.²²³

Innovation approach

Triple Steelix constitutes a so-called 'innovation system' and provides a structure contributing to the production of innovation and new thinking. It uses the 'triple helix' model in accordance with the VINNVÄXT approach. In the project, innovations do not refer only to technical solutions but can also concern better production methods, the rational use of new steel sorts or methods for different kinds of services.²²⁴

Geographical approach

Regional conditions are not specifically considered in the context of *Triple Steelix*. The direct focus here has been on the enterprises despite their location. Administrative borders were not considered in this context as participants have not always been in the area of the participating municipalities. The development work is undertaken on the basis of the requirements of the enterprises while the issue of geography is only of secondary importance. The private enterprise sector was also involved before the public actors²²⁵. In this sense the project can be seen as highly flexible in respect of regional differences.²²⁶ Even though the steel branch in the region is a world leader the region as a whole, in its national context, is considered peripheral. As such, the issue of peripheral regions in the national context is addressed although, regionally, the project retains its focus on the regional centres. *Triple Steelix* works with different operation areas that are also geographically concentrated (i.e. the projects of *tunnplått i Borlänge* and *rostfritt i Avesta*). In addition, the instrument has probably contributed to innovation diffusion to peripheral parts of the region but this has not been an explicit target of the programme or the project.

Conclusions

The long-term perspective, the strategic idea in the regions, and competitive project selection are distinctive to VINNVÄXT-projects. The programme also has a relatively large pot of financial resources to disburse. The main outcomes of the programme are innovations, increasing regional capacity, new networks, and the building of a learning process. The programme starts from the deliberate notion of facilitating regional innovation systems, which is something fundamentally different from traditional industrial promotion. The long-term goal is to build a well-functioning regional innovation system.

²²¹ Christensen, L.

²²² Messing (2006a).

²²³ Triple Steelix. Årsrapport (2006).

²²⁴ Triple Steelix, <http://www.triplesteelix.se>

²²⁵ Maria Engholm

²²⁶ Jan Messing

The programme has no special focus on weaker regions. The VINNVÄXT programme is a special tool directed to those regions that already have good potential within a certain branch. It is a national instrument for the most promising regions and industries. However, as the example of the *Triple Steelix* project shows, the programme also indirectly supports peripheral regions. Even though the steel branch in Bergslagen is globally competitive, the region, in the national context, is considered peripheral. The project is therefore designed to make use of all the potential around the strong industry branch, to support small and medium-sized companies and thus to support the growth of the service branch around it. A significant level of development potential is felt to exist around the large globally competitive companies in the region. By increasing the attractiveness of the region, this growth potential can be used regionally in Bergslagen, instead of giving this potential away to other regions and countries.

VINNVÄXT supports local and regional networks and partnerships. In this respect the experiences of the instrument in Bergslagen have been positive. The *Triple Steelix* project is based on networks and ways of working that already existed in the region. Thus it can be considered as an initiative arising from already existing regional and local conditions. It has managed to strengthen the existing networks and to create new regional partnerships and ways of cooperating. The project is based on functional regions and new partnerships have been created as the actors work together across administrative borders. Thus it has contributed to cooperation between actors that do not normally cooperate with each other. The involvement of the local authorities in the initiative has been stronger than that of the regional authorities who have, primarily, had the role of financiers. At least in the case of *Triple Steelix*, the private enterprises needs are prioritised. Usually contact is firstly established with private enterprises and only then with public actors.

The close cooperation and dialogue between the national (Vinnova) and regional actors (*Triple Steelix*) is regarded as being extremely valuable. This can also result in coherent approaches at both levels as in the case of *Triple Steelix*. The regional and local actors perceive the project as a learning process. Follow-up research that is carried out can support this process. The development support allocated by Vinnova played an important role in *Triple Steelix*. It supported the cooperation between the wide range of actors while also helping to attain legitimacy for the project. Vinnova's goal of improving gender equality has also been realised through *Triple Steelix's* K2 project which aimed to promote women's competence within steel and engineering sectors.

The VINNVÄXT programme is a complementary instrument to other regional development instruments such as the RGP. It is a national instrument targeted to the particular regional needs of certain already successful branches. It can be considered as a national regional instrument whereas RGP is regionally administered instruments. They both promote regional growth. The VINNVÄXT instrument does not seem however to have any "regional development task" in the traditional sense. Nevertheless, it can however be regarded as an instrument that can help enable some successful initiatives to be carried out in all parts of the country. It can support potential regional initiatives which would otherwise not be realised. It can however be argued that some of the most peripheral areas, particularly characteristic of the Nordic countries, are indirectly excluded from this type of process.

Cross analysis of the national overviews and case studies

Nordic (regional) innovation policies display both similarities and differences. Innovation policies in the Nordic countries have thus far been more or less governed from the national level. Norway seems to be the exception here as an explicit will to "regionalise" the governance of innovation policies has emerged. In Denmark it is still too early to see how much power the newly established regions will receive in this respect. While in both Sweden and Finland it seems likely that the state will continue to govern the innovation policy process.

Innovation policy in the Nordic countries has traditionally at least been closely connected to the R&D sector. One clear conclusion that emerges from the national overviews is that the notion of innovation is also dealt with in growth policies and in a number of other sector policies, including regional policy. To make a distinction we can say that both a "regional policy with innovation dimensions" and an "innovation policy with regional dimensions" can be seen to exist. In the context of national rural policies however the innovative approach is not that obvious, but this dimension is however now emerging and is included in some EU-programmes. In addition, we can see that all Nordic countries have adopted the broad approach to innovation or at least are currently taking the initial steps towards moving away from a concentration on a high-tech and research-based innovation policy. Nevertheless, innovation policy across the Nordic countries still retains a strong focus on high-tech industry while maintaining its traditional emphasis on manufacturing industry as opposed to the newly emerging service sector.

There are many tools available to stimulate innovation in the Nordic countries. Most tend to be directed towards metropolitan/growth areas, but there are also now some instruments specifically designed for the periphery. In general, regional policy tends to be characterised by increasing "regional blindness. This means that there are few specific measures addressing weaker regions and, in principle, all regions have the same tools available for use. Another general trend here is that regions are increasingly encouraged to utilise their own strengths. The measures available in respect of innovation policy tend to favour already strong and competitive regions. This statement is based on the fact that many programmes are designed as competitions, where the "best" proposal receives the funding.

Common to all the countries discussed here is the desire to encourage networking and partnership in one way or another. As with Finland, Norway and Sweden have each adopted the idea of having "Centres of Expertise" (CoE in Finland, VINNVÄXT in Sweden, NCE in Norway and to some extent this can be seen also in the context of the RTC's in Denmark) which have a central role to play in developing regional innovation systems. These programmes have been concentrated in regions with good potential to become leading growth centres. The programmes have thus made these regions more attractive to business and have helped develop strategic planning in the regions.

The partnership idea is clearly implemented in the context of national regional policies and innovation policies. New cooperation forums for actors have also been established - the Danish Innovation Council is a good example here of a forum that has members from many different sectors. In the context of the policies themselves there is also a demand for joint financing from the state, regional and to some extent also the local level as well as from private actors. The 'triple helix' concept is used across all the Nordic countries.

Concerning the case studies undertaken here we can see that a common feature for some of them is that they have been used as role models in their national contexts (i.e. Oppland County Municipality, Oulu CoE and the Growth Agreement in the Eyjafjörður region). This

does however raise the issue of whether they remain representative, or otherwise, of the general implementation level of innovation policy experienced across Norden.

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Appendix

