

STI OUTLOOK 2002 – COUNTRY RESPONSE TO POLICY QUESTIONNAIRE**SWEDEN****1. General framework and trends in science, technology, and industry policy**

In Sweden, as opposed to many other countries, the concept of innovation policy has been rather absent until very recently in the general political rhetoric, although the importance of production of new knowledge and innovation for economic growth has for a very long time been widely recognised. Instead, at a general level, the political agenda has been developed along two different strands, one in growth policy and another in research policy. After almost a decade of deep economic crisis, the Swedish growth policy agenda went through important changes towards the end of the 1990s. Having focused heavily on fighting the large public budget deficits during the first half of the 1990s, the policy agenda shifted to include more of growth policy measures, such as instruments found in industrial and research policy. The policy reformulation took place against the background of almost three decades of comparatively slow growth in Sweden and increasing regional economic imbalances. An increasing part of the debate during the final years of the 1990s focused on the seeming paradox of slow long-term economic growth and simultaneously very high RTD-spending in Sweden, primarily by Swedish industry, but also by the Swedish university sector. As a consequence, a growing part of the Swedish policy system started to question the efficiency of the Swedish national innovation system (although not discussed in these terms), in terms of producing innovations and economic growth. One could argue that two major policy strategies were presented.¹ The first focusing on creating an increased co-ordination of growth and research policies through a considerable reorganisation of the Swedish structure of public RTD funding, which was effective in January 2001. The second is focusing on stimulating regional economic growth through the implementation of a new institution in Swedish growth policy, the “regional growth agreements” launched in March 2000.

The concept of innovation systems in general, and national innovation systems in particular, rapidly entered and spread in the industrial, research and economic policy debate and policy thinking towards the end of the 1990s in Sweden. There was also a major reorganisation of the organisational structure for public funding of RTD and support to business and regional development. This can be seen as an expression of a move towards a national innovation policy, most explicitly manifested through the establishment of the Swedish Agency for Innovation Systems (VINNOVA). It should be noted that the focus on economic growth and the move towards a more comprehensive innovation policy, based on an innovation system perspective, has in no way been a straightforward policy formulation process. The reorganisation in the structure for public funding of RTD and support to business and regional

¹ Göran Marklund, NUTEK, *Strategies for diversification and strengthening of regional economies and innovation systems in Sweden*, Paper presented for the fifth RESTPOR Symposium in Kashikojima, Japan 5-7 September 2000

development follows two government bills² presented in spring 2000. These bills closely relate to each other, although the first, issued by the Ministry of Industry, Employment and Communications, outlines a new organisational structure for public support to business and regional development and the other, issued by the Ministry of Education and Science, outlines a new organisational structure for public funding of RTD.

During the recent period there has also been a move towards increased and more efficient co-ordination between different policy areas crucial to innovation policy. The increasing policy co-ordination has been more obvious within each of the two strands of the policy agenda (growth policy and research policy) than between them. Increased co-ordination in growth policy was manifested through the merger of three ministries in the Ministry of Industry, Employment and Communications in 1999. Concerning research policy, in the spring 2000, Thomas Östros, the Minister of Education and Science, was made formally responsible for the overall co-ordination of research policy.

Swedish research policy for the period 2000-2003 was presented in mid September 2000 in the government bill on research policy³. Although the bill essentially contains proposals for strengthening basic research and postgraduate education, it also includes new perspectives for a more comprehensive innovation policy, mainly through a new organisational structure, and particularly through the assignments of the new Swedish Agency for Innovation Systems (VINNOVA). The main objectives of VINNOVA are:

- To finance research, development and demonstration activities which meet the needs of business and the public sector.
- To foster co-operation between universities, industrial research institutes and business.
- To promote the diffusion of information and knowledge, especially to small and medium-sized enterprises.
- To stimulate increased Swedish participation in the EU's RTD framework programmes.
- To evaluate and develop the Technology Foresight process.
- To develop the role of research institutes in innovation systems.

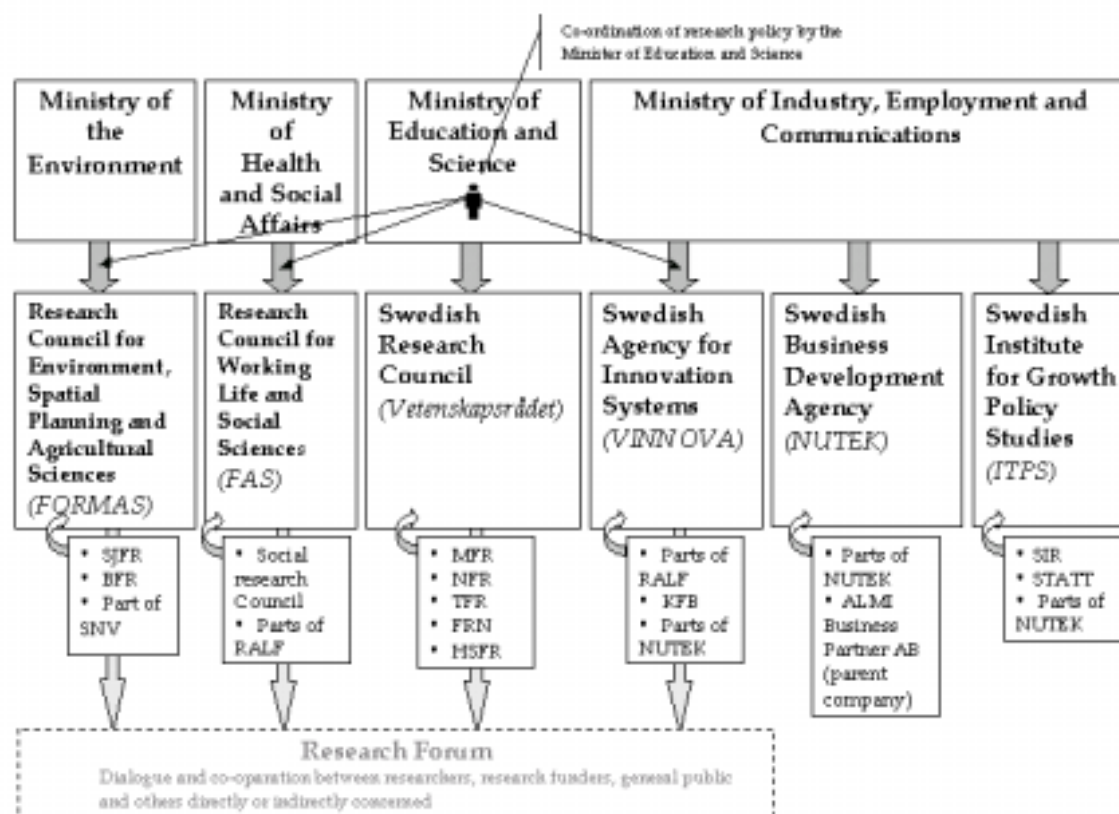
The new agencies came into work on 1 January 2001. All in all, the reorganisation involves some 15 organisations. The reorganisation reduced the number of organisations to six (see next page). The new structure is to enable more focused public efforts in areas of strategic importance, greater efficiency, and a better adaptation to the needs of target groups.

On the RTD funding side, the new structure includes the new **Swedish Research Council**, incorporating three separate councils for the humanities and social sciences, for natural sciences and technology and for medicine. With a total budget of around 200 MEUR or 1 878 MSEK (exchange rate 100 SEK=9.50 EUR) for 2001, this body is the largest actor within the new organisation of research policy. Also, two special research councils were set up: one in the area of working life and social sciences, and the other in the area of environment, spatial planning and agricultural sciences. Another feature of the new RTD funding structure is **VINNOVA** (the Swedish Agency for Innovation Systems), which will create a more effective

² Government Bill 1999/2000:71 (Certain Organisational Issues in Industrial Policy) and Government Bill 1999/2000:81 (Research for the Future – A New Organisation for Financing Research). See also summaries of these documents in section 6 of the present report

³ Government Bill 2000/2001:3 (Research and Renewal)

and forceful organisation for promoting Swedish innovation systems (total budget of around 120 MEUR or 1 118 MSEK for 2001). This body took over the RTD-funding responsibilities of the present NUTEK⁴, and also includes the activities of the former Transport and Communications Research Board (KFB) and about half of the activities of the former Council for Work Life Research (RALF).



Furthermore, the new organisational structure includes the establishment of a Research Forum for dialogue among researchers, research funders, the general public and others directly or indirectly concerned by the performed research. The aspect of co-ordination is also in focus for the proposal of broadening the Research Advisory Board⁵ to include innovation-related issues.

It can be noted that the organisational structure concerning defence research also changed from 1 January 2001, when the two most important research performers among the defence authorities (Defence Research Establishment, FOA and the Aeronautical Research Institute, FFA) merged into a new organisation, Swedish Defence Research Agency (FOI). The purpose of the merger was to create a modern and efficient research establishment. Previously, the threat pattern and needs have been the predominant driving forces for the development of the Total Defence System, whereas the RTD has had a more supporting role. The Total Defence reform signifies that the RTD must take on a more explicitly driving function. The report *RTD for the Total Defence System* hold the opinion that the future RTD activity should be oriented to support the Total Defence System as follows:

⁴ NUTEK The Swedish Business Development Agency

⁵ An advisory body chaired by the Minister for Science and Education that consists of persons from the research society and from industry.

- “Draw on the unique possibilities that RTD efforts hold out in order to obtain and describe future feasible development options, and to find various means necessary to anticipate different developments of events and be instrumental in carrying such means into effect.
- Follow, understand and explain crucial trends in the developments in relation to security policy, technology and Society, and delineate in an active manner and make the consequences for the future design of the Total Defence System evident.
- Target, evaluate and make contributions towards realising new optional lines of action, by means of which the demand for enhanced adaptability, etc., can be made tangible.
- Seek co-operative opportunities in the form of national and international effort for the purpose of supporting the Total Defence System with technical know-how, originating from other countries and Sweden as well.
- Support preparation for and participating in international operations within the Total Defence System.
- Be a contributor to ensure the Total Defence System’s remodelling in the next few years.
- Draw up the line of activities as regards materiel acquisition and foster the in-service support of existing systems.”⁶

On the business and industry development side, Government endeavours to stimulate enterprise and renewal focusing on creating good basic conditions for industry. Regulations should be as simple and practical as possible. Efficient competition should prevail in the different parts of the market, so as to ensure that developments benefit consumers. Through the Swedish Business Development Agency (NUTEK) and Almi Business Partner, the Government is also committed to measures to help enterprises, such as providing information and advice, sponsoring projects and supplying financial aid. There are four basic objectives for work on business development:

- Simple and practical regulations for enterprises.
- High quality advice, information and services from public authorities to enterprises and individuals.
- Efficient competition and well-functioning markets.
- Good opportunities for continuous professional development at enterprises and for individuals.

A new **NUTEK (Agency for Business Development)** has been set up. This agency includes business development and regional development activities from the former NUTEK and it also incorporates the parent company, owned by the national government, of ALMI Business Partner. The ALMI group is a regionally organised structure, with about 40 local offices jointly owned by the parent company and local/regional bodies that provide consultancy services for business development, including financing.

In order to co-ordinate different policy areas and to better adapt policy to varying regional requirements, Government has established a regional industrial policy. Through this policy Government aims to stimulate

⁶ SOU 2001:22 Research and Development for the Total Defence System.

sustainable economic growth, the emergence of more and expanding businesses, and increased employment opportunities for both women and men on the basis of the special conditions prevailing in each region. Regional development agreements are an important tool for implementing this policy. Regional industrial policy and development agreements are based on the following considerations:

- Conditions for development are different in different parts of the country. An effective policy must take this into account.
- Government measures of importance to the regions are carried out by a number of actors in different policy areas, Effective use of resources requires co-ordination.
- The Regional Development Policy is dependent on business sector participation.

To improve knowledge for the needs of growth policy development, a separate **Institute for Growth Policy Studies (ITPS)**⁷ was set up. The mission of this agency includes policy analysis, policy intelligence and policy evaluation. Important areas for analysis are growth, innovation systems and entrepreneurship. The founding of ITPS can be seen as a sign of increased attention to policy evaluation and policy learning. For the first time evaluation of policies was prioritised. However, at the level of public programmes evaluations have been carried out for a long time.

Two government bills with relevance to innovation policy were made public during September/October 2001. The first one “R&D and Co-operation in the Innovation System” 2001/02:2 is dealing with innovation policy issues. The bill mainly focuses on the role of the semi-public Industrial Research Institutes and the Swedish Agency for Innovation Systems (VINNOVA) in the Swedish Innovation System. VINNOVA is one of the most important government agencies for funding research motivated by the needs of industry and society. An important task for VINNOVA is to partly finance the Industrial Research Institutes. Government proposes a restructuring of these institutes with the objective to create a flexible and efficient structure with a few international competitive institutes that have strong industrial support. Government stresses that biotechnology, information technology, micro electronic and material technology should be prioritised in the restructuring. The bill also treats the issue of commercialisation of research findings. As an instrument in commercialisation of research findings all universities will be given the opportunity to establish holding companies. These holding companies should also be able to create affiliated companies for mediating commissioned education to public universities and university colleges.

The regional policy bill “A Policy for Growth and Vitality in all Regions” 2001/02:4 focuses on the establishment of a new policy area - regional development policy. The purpose is to establish a well co-ordinated policy for all parts of the country, i.e. to create regions with well-functioning and sustainable local labour markets and with good services. Government argues for the need of offensive strategies to reach this objective including a) efforts within areas, whose investments has great importance for regional development and b) a clear division of responsibility between the government and municipalities. The latter means that municipal co-operation bodies should be established in all counties from year 2003. This is a major change in the regional policy. These bodies will have the authority to make decisions about county plans for regional infrastructure and authority to decide about some governmental funds for regional development. One task of these bodies is to create programs for the development of the county including e.g. regional growth programs. The regional growth agreements will develop into regional growth programs starting in 2004. These programmes should consist of analysis, goal and regional priorities and a plan for financing, implementation and evaluation. The government also proposes to establish a national programme for development of innovation systems and clusters. The programme will

⁷ see www.itps.nu

carry on from 2002 to 2004 and the budget contains 7 MEUR.⁸ The responsibility for the programme will probably be shared by VINNOVA, NUTEK and ITPS, but how the budget will be distributed among them is still under discussion.

2. Public sector research and public research organisations

The Swedish RTD-system has a particular profile compared to other countries. The system is dominated on the one hand by around 10 large RTD-intensive multinational enterprises and on the other hand by less than 10 public universities, while the institute sector is very small⁹. This structure has been in place for a long time and will not be altered in the foreseeable future.

Another characteristic feature of Swedish RTD system is that mission-oriented research funded by the government, for such purposes as energy supply, industrial development, conservation of the environment, etc. is to a large extent carried out at universities. Government agencies that distribute funds for mission-oriented R&D are labelled sector agencies, which emphasises the fact that the RTD funding responsibility of such agencies is included in an overall responsibility for a societal sector.

Government appropriations for R&D have been high by international comparison, but less so in recent years. Total Swedish public funding of R&D in 1999 amounted to about 15 billion SEK or 1 600MEUR compared to 18 billion SEK in 1997. (The decrease is largely an affect of a decrease in defence research¹⁰). More than half of this sum consisted of direct civil national governmental budget appropriations of which the major part was allocated to higher education organisations. This reflects a policy aiming at minimising fragmentation of research efforts and linking research with the educational function of universities.

The research bill of the year 2000 mentioned earlier announces that budget appropriations for research and postgraduate education will increase by 1.3 billion SEK (135 MEUR) during the period 2000-2003. This implies an increase per annum of approximately 2 percent. Slightly more than 50% of this increase is destined for direct funding in the higher education sector. This includes the funding of 16 new graduate schools (214 MSEK, i.e. 23 MEUR).

Government also proposes a restructuring of the semi-public industrial research institutes with the objective to create a flexible and efficient structure with a few international competitive institutes that have strong industrial support. The government stresses that biotechnology, information technology, micro electronic and material technology should be prioritised in the restructuring.

3. Government support for private-sector R&D and innovation

Public funding of RTD in enterprises is very rare in Sweden. Most of this funding is defence related. Seed funding is small, around 1 MEUR/year. However, some new measures to foster R&D and innovation in SMEs have been introduced recently.

⁸ The Government Bill 2001/02:4, *A Policy for Growth and vitality in all regions* and the Government Bill 2001/02:7, *Regional Co-operation and County Administration*

⁹ OECD, *Main Science & Technology Indicators* 1999:1

¹⁰ It is worth noting that research funding for the defence has fallen from a level of about 25 percent of all governmental RTD appropriations, to about 7 percent during last few years. To deal with the reductions in employment, a special commission was set up at the Ministry of Industry, Employment and Communications.

In 1995 a special mission was commissioned to NUTEK by the Government to create a system that would give SMEs better opportunities to make use of technology in their business development. The system should facilitate the trade in technological services between SMEs and public R&D technology providers like institutes, universities and university colleges. A well co-ordinated network should be created to make it possible for SMEs to find adequate technological service and for technology providers to reach the SMEs with their offers. Special attention should be given reinforcement of the SMEs' demand for service. The special mission was concluded and reported in October 1998. The Swedish Innovation Relay Centres, which are consortia networks of institutes, industrial liaison offices, and technology parks, played an important role in establishing such a co-ordinated infrastructure, and their actions have consequently become fully integrated in this national effort. An evaluation of the experimental projects, international comparisons etc created the basis for a permanent technology transfer program that was proposed to the Government on October 1998. In June 1999, a start up period of this national program TUFF ("Technology exchange for the development of Business") was initiated. On 1 January 2001 the responsibility of this program shifted from NUTEK to the newly created VINNOVA.

A new programme (IT.SME.se) was launched by NUTEK in April 2001. The programme aims at increasing the competence and strategic use of information technology in SMEs for enhancing competitiveness and growth. The programme funds actions initiated by regional actors (county administration, universities, entrepreneurial networks etc.). The target group is the small business entrepreneurs (0-10 employees). The overall budget is 3,2 MEUR over a two-year period.

The issue of administrative simplification is also a topic in industry policy. The reason for this is the stress of the role of innovation and growth played by start-up firms and SMEs in general. In 1994, the Small Business Council was formed on an initiative from the Minister of Industry and Commerce. In 1998 the Council presented a report on the need for administrative simplification containing about 70 topics from the accounting system for restaurants to public procurement. An example of the proposals put forward by the Council is the simplification of registration of start-ups, which has resulted in the possibility of filling in electronic forms for registration on the internet.¹¹ The forms include help functions and interactively identify incorrect entries.

4. Enhancing collaboration and networking among innovating organisations

Enhancing collaboration between universities and industry has been an important objective of NUTEK (and today VINNOVA) for many years. Two new programmes have been launched by VINNOVA. The BIOIT-program was launched during the autumn of 2001. The aim is to integrate university research in areas like microelectronic, physics and biotechnology and to stimulate researchers to co-operate with companies. Together with Swedish Foundation for Strategic research (SSF) VINNOVA launched a program called VINST (research co-operation for smaller high tech companies) during the autumn of 2001. The aim is to stimulate smaller high-tech companies to co-operate with researchers at universities and research institutes in the development of their next product generations.

Promoting commercialisation of research

The legal framework of intellectual property rights for university researchers in Sweden constitutes an exception from the general regulation on patents on ideas developed by employees. The general rules are found in the law (1945:345) of the right to inventions of employees. The law concern inventions made by public and private employees and states that it is the employer who has the right to inventions made by

¹¹ www.kontakt-n.nu

their employees. However, an exception is made for university researchers (but not for researchers in public and semi-public research institutes). The principal rule is that university researchers have the right to exploit and commercialise inventions that have come about within the realm of their employment at universities, the so-called “teacher exception”. There are several reasons for this exception. One is to safeguard the scientific freedom. The argument is that the freedom of research may be hampered if those who make the findings cannot freely dispose of them. Another reason is that the teacher exception increases the output of publicly funded research in terms of patents by giving researchers incentive to commercialisation of findings.

The teacher exception has been under debate for some years. In 1996, a public committee on this issue came to the conclusion that the regulation was not to be changed.¹² The committee stressed the importance of the exception as an incentive for increased exploitation of inventions developed within the higher education institutions. The issue was raised again in a report from a parliamentary committee on research that was presented in December 1998. The parliamentary committee recommended the IPRs of university researchers to be transferred to the employer, *i.e.* the universities. The committee also proposed a new formulation of the Higher Education Act that stipulated that the higher education institutions should engage in taking charge of the IPRs that might stem from any research result. In the bill 1998/99:94, the government stressed that it ought to be possible to increase the commercialisation of research findings. However, it was not proposed to abolish the teacher exception. Instead, the bill suggested negotiations between employers associations and employees unions in order to improve the conditions of commercialisation of research findings by collective agreements.

Universities were through a legal act in 1996 given a third mission (in addition to research and teaching), *i.e.* to collaborate and interact with society. The implementation of the new mission did not mean that universities got new resources. They had to fulfil this task within the realm of existing resources.

Since 1994/1995, the commercial exploitation of university research and inventions has been the focus for some new programmes. In 1995, seven Technology Link Foundations located in seven major university cities became operational. Together they received capital of about one billion SEK (115 MEUR), the return on which they may use to increase commercial benefits from university research and to encourage co-operation between industry and academia. The mode of operation in the Technology Link Foundations varies between the different units. They have developed differently depending among other things on the conditions and need in each region.

In 1994-95, eleven *University Holding Companies* were formed in Sweden. Their mission is to form project companies in order to exploit research from the universities and to develop services for such exploitation. They are themselves owned by the universities and are expected to become minority owners in firms created jointly with researchers and industrial actors for the exploitation of university research.

The Technology Link Foundations in co-operation with the Holding Companies have, in turn, formed *Patent & Licensing Offices*, which actively support researchers’ exploitation efforts. The formation of actors like the Technology Link Foundations and the University Holding Companies as well as the Patent & Licensing Offices are concrete manifestations of the belief of the political system in the commercial potential of RTD and academic research.

The government commissioned an investigation of the activities at the Technology Link Foundations and the University Holding Companies. The Swedish National Audit Office (RRV) published the report from the investigation in spring 2001.¹³ According to the report, the University Holding Companies give

¹² SOU 1996:70 NYFOR; Co-operation between universities and companies

¹³ www.rrv.se

universities and the university colleges a better opportunity to improve their work with the third mission and the Technology Link

A new educational measure was launched by NUTEK in 1999. It was directed towards consultants experienced from work with growth companies. The education gives them an opportunity to deepen their knowledge of the growth process. The educated consultants has now joined together in the Venture Catalyst Association with the aim to work for good business ideas, efficient growth process and financing and offer an arena for information and knowledge exchange.

The Technopole programme is a demand led initiative from NUTEK that aims at fostering the process of commercialising research results by stimulating the foundation of new technology based firms (NTBFs) and fostering the growth of NTBFs. In 1998, 24 Technopoles received funding, today eight of these receive funding from NUTEK. A Technopole may be a unit of a university (some have developed from being industry liaison offices) or part of a science park structure or an independent formation. The interest in furthering the creation of new technology-based firms has resulted in actions taken in most university regions. New instruments have been created not only to stimulate the creation of new technology based firms but also to provide management support activities. Good examples are the Business Development Programmes for Technology-based Growth Firms organised by the Centre for Innovation and Entrepreneurship in Linköping and the Centre for Entrepreneurship in Uppsala. Around the universities and Science Parks in Sweden different initiatives have been taken to give technology start-ups access to resources at incubator units. Good examples are found in Gothenburg (Chalmers), Linköping, Lund and Uppsala. The last years "green houses" for student start-ups have been created in many of the new universities and university colleges. Örebro, Jönköping, Halmstad, Växjö and Gävle provide such examples.

In Sweden it is up to the university department to decide whether or not to take on contract research (or to participate in publicly funded joint R&D projects). There are no special laws in Sweden that impairs contract research for external partners. As has been shown Government urges universities to collaborate with business and other organisations. Some regulations also exist that promote such collaborations. In the Higher Education Act (1998:1003 Ch. 4 §15) is stated that, apart from the degree of scientific competence, the ability to collaborate with surrounding society and to inform externally of research and development work is a qualification ground when employing teachers/researchers at universities. University researchers may also carry out sideline activities. In the Higher Education Act (1992 Ch. 3 §7) it is stated that researchers at universities may beside his or hers appointment carry out contract research activities within the subject filed of the appointment. The condition is that the activity does not harm the public confidence in universities. This law provides the possibility to earn additional income from contracted research.

Promoting mobility

Legal regulations that are likely to influence the mobility of researchers are few in Sweden. There are no particular conditions of employment for university researchers that restricts them from taking appointments in companies. Furthermore, earning opportunities are much more favourable in companies compared to universities. However, these differences in earning opportunities hamper the mobility of company researcher to universities. What really restricts the mobility of university researcher is that research outside universities has not been considered a qualification in the career system of a university researcher. Temporal mobility is supported by legislation. According to a law on leave of absence (1997:1293 §3), university employees have the right to be on leave for up to six months for carrying out business activities. However, a condition is that these activities do not compete with the activities of the employer and that the leave does not mean substantial inconvenience to the activities of the employer. University employers also

have the possibility to give the employees leave of absence if particularly reasons exist and if it can be done without inconvenience for the employer (Regulation on leave of absence 1984:111 §10b)

The universities may finance so-called "contact researchers". This means that researchers employed at the university during a period can work full or part time at a company. Government money can be used for at the most half of the salary. Other ways of promoting temporal mobility and collaboration are visiting professors and industry postgraduate students. A visiting professor means that an individual with professor's competence but employed outside the university *e.g.* in a company, on a part time basis, can work at the university. In the same way industry employees can within his or hers employment take part in postgraduate studies at a university. The financing is most of the time shared between the company and the university.

In the Government Research Bill 1996/97, the need for increased measures for supporting young researchers and their mobility within Sweden and internationally was stressed. In the most recent Research Bill, the need for increased mobility between universities, university colleges and other parts of the labour market is stressed again, and the government identifies a need for investigations concerning possible ways to achieve this. As part of the interest in increasing mobility, new graduate research schools have been created over the years. 16 additional graduate research schools are foreseen in the Research Bill 2000. The large research foundations like the Foundation of Strategic Research have all financed new graduate schools. These graduate schools are set up in close co-operation with industry. Even though their primary objective is not to promote mobility but to increase the number of researchers within areas of strategic importance to Swedish industry and to stimulate increased co-operation between higher education institutions and companies, one expected effect is an increase in mobility.

5. S&T human resources

Within a few years, a large share of professors and teachers in Swedish universities will reach retirement age and will need to be replaced. The need for tackling the upcoming generation shift in the Swedish university system is an important point of departure for the new research policy with increased efforts on graduate education, research training and the recruitment of young scientists. Another important point of departure is the need for concentration of efforts on important research fields and the need for stimulation of cross and multidisciplinary research.

From 1 January 2000 there has been a tax reduction for foreign experts, for instance scientists, employed by enterprises. This tax relief for individuals can only be received for a maximum of three years. The expert has to be highly qualified as well as possessing a unique expertise. Until May 2001 the authority in charge received 340 applications and until now around 60 applications have been considered and 50 approved. The Ministry of Finance calculates that around 400 experts per year could be entitled to the tax relief.¹⁴

6. International co-operation and globalisation

Swedish policy makers at all levels are extensively involved in international networks, for example as part of the work with the EU framework programme, which provides ample opportunity for exchange of information and experience. This is not part of any formalised Swedish scheme. In the area of innovation policy relatively few Swedish policy makers go abroad as part of exchange initiatives, and the international mobility is low.

¹⁴ Government Bill 2000/01:12

Sweden, through VINNOVA, has taken part in work concerning benchmarking activities in areas relevant to innovation policy, both in international organisations like the OECD and projects initiated within Sweden. One report was the result of an OECD co-operation on National Systems of Innovation.¹⁵ Swedish RTD programmes are on a regular basis subject to international evaluations, which in a way serve as benchmarking activities. VINNOVA is also the Swedish co-ordinator and responsible for the national EUREKA-office. VINNOVA is also responsible for the Swedish COST-participation.

The SME international co-operation programme (SMINT) of VINNOVA aims to allow small and medium-sized companies the opportunity to take part in the EU's framework programme for research and development. The grant contributes to the costs of pilot studies in technical fields that will lead to the preparation of a project application, together with European partners, for co-operation within EU's framework programme for research and technical development.

NUTEK and the Finnish TEKES started in 1996 the research programme INWITE (Integrated Technologies for Wireless Telecommunication) with participants from Swedish and Finnish research institute and economic support from Nokia and Ericsson. The first phase was finished in 99-00 and the next phase with the name EXSITE (Explorative System-Integrated Technologies) started in January 2001 with economical support from VINNOVA, TEKES, Ericsson, Nokia, the Swedish Foundation for Strategic research (SSF), Swedish Research Counsel and The Finnish Academy.

Invest in Sweden Agency (ISA) was established in 1995 by the Swedish government to attract and facilitate direct investment in Sweden. ISA is a government agency providing business and economic data, contacts, solutions, and procedural assistance free of charge for foreign companies considering setting up or expanding business operations in Sweden. The mission of ISA is to attract and facilitate foreign direct investments in Sweden. Responsible to the Ministry of Foreign Affairs, the Agency assist companies interested in locating in Sweden by providing a wide range of services.

The Science & Technology Office is a division of the Institute for Growth Policy Studies. This division support the policy-making systems with policy intelligence and have offices in Washington, Los Angeles and Tokyo.

7. Industry-related policies

The overall objective of the recently established regional industrial policy is as follows:

"On the basis of the unique features of each region, sustainable economic growth should be stimulated which will contribute to more and expansive enterprises and to an increase in employment."¹⁶

The point of departure for this policy is the potential that exists for accelerating economic growth in Sweden by making better and more co-ordinated use of the resources available in all regions. To this end industrial policy is built on close co-operation between different local and regional actors and sectors of society (*e.g.* the business community, parties on the labour market, the educational sphere, etc.). The so-called regional growth agreements are an important tool in implementing the policy.

The Swedish Government initiated the regional growth agreement process in 1997.¹⁷ The government stated that agreements on regional growth were to become the principal instrument for co-ordinating and

¹⁵ NUTEK B 1998:99 The Swedish National Innovation System - A Quantitative Study. Stockholm: NUTEK Förlag

¹⁶ www.naring.regeringen.se/tillvaxt/avtal/inenglish.htm

¹⁷ Government Bill 1997/1998:62 (Regional Growth for Employment and Welfare)

adjusting the policies of the various sectors, and also for exploring new approaches to the promotion of regional and local industrial development.¹⁸ Thus, these agreements were to be the principal tool for the implementation of the new regional industrial policy. The first regional growth agreements were launched on 15 March 2000. When the first generation of such agreements were signed between 21 regions and the Swedish Government. Proposals for such agreements were prepared during 1998 and 1999 by quite broad regional partnerships consisting of public authorities on the regional and local level, industry and industrial organisations, unions and other organisations etc. in dialogue with national agencies.

Measures pertaining to innovation policy are major components in the regions' growth strategies. To a substantial degree they focus on RTD activities, technology diffusion institutions and venture capital markets. These regional growth strategies are in general geared towards the specific industrial specialisations in the regions. The ambition has been to employ innovation systems or cluster approaches in the analysis backing up the proposals. However, the resulting analyses can in a large number of cases better be characterised as traditional sector analyses.

In September 2000 a parliamentary commission on regional policy published a report.¹⁹ The commission was to analyse the consequences for regional policy in the wake of new technology, internationalisation of the economy and the Swedish EU membership. Some important conclusions concern the need for institutional reform in the implementation of regional policy and the further development of the institutional setting and the process concerning Regional Growth Agreements. The report also stresses the importance of inter-firm co-operation, entrepreneurship and new technology as vital factors for economic growth. Furthermore, it recognises the important potential of universities and university colleges for regional growth. Among other things, the commission suggests that strategic discussions concerning the long-term orientation and specialisation of university colleges be included in the further development of the regional growth agreement process.

NUTEK started discussions a year ago with regional actors in order to create a common platform for how to support and strengthening a cluster-based regional growth policy. These discussions have been summarised in the report "Innovative Clusters in Sweden".²⁰ The report gives a number of examples of regional clusters, established ones as well as a number of cluster embryos. The cluster approach will be clarified and interpreted in different processes and by a common Cluster Programme launched by NUTEK/Almi Business Partner at the beginning of 2002. The programme will stress some basic conditions such as: a cluster policy transcends sectors by co-ordinating different policy areas, maximises the use of research contributions from society as well as from business and requires monitoring and evaluation.

A central part of Swedish innovation policy is to develop effective, globally competitive, innovation systems in regions in order to strengthen the regional growth potential. This requires, among other things, strategic and purposeful innovation policy profiling of the regions. VINNOVA intends to announce a new programme from 2002 onwards with the provisional title "Regional Growth by development of Dynamic Innovation Systems". The aim is to stimulate innovation and growth in Swedish regions. The programme will attempt to achieve an effective co-operation within each region between companies, the R&D system, and the political system (Triple Helix) with a view to developing dynamic regional innovation systems capable of giving the region international competitiveness in focussed areas. These areas will be defined on the basis of business development opportunities, regional areas of strength, and the common ambitions of those involved. 2001 is devoted to the planning and design of this programme.

¹⁸ www.naring.regeringen.se/tillvaxt/avtal/inenglish.htm

¹⁹ Official Government Committee (Final report – parliamentary commission on regional policy), SOU 2000:87

²⁰ Innovative Clusters in Sweden, NUTEK 2001.