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Regional Innovation Monitor

Regional Innovation Report (Stockholm)

To the European Commission

Enterprise and Industry Directorate-General

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PREFACE

The Regional Innovation Monitor (RIM)¹ is an initiative of the European Commission's Directorate General for Enterprise and Industry, which has the objective to describe and analyze innovation policy trends across EU regions. RIM analysis is based on methodologies developed in the context of the INNO-Policy Trendchart which covers innovation policies at national level as part of the PRO INNO Europe initiative.

The overarching objective of this project is to enhance the competitiveness of European regions through increasing the effectiveness of their innovation policies and strategies. The specific objective of the RIM is to enhance the scope and quality of policy assessment by providing policy-makers, other innovation stakeholders with the analytical framework and tools for evaluating the strengths and weaknesses of regional policies and regional innovation systems.

RIM covers EU-20 Member States: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden and the United Kingdom.

This means that RIM will not concentrate on Member States where the Nomenclature of territorial units for statistics NUTS 1 and 2 levels are identical with the entire country (Estonia, Latvia, and Lithuania), Malta which only has NUTS 3 regions, Slovenia which has a national innovation policy or Cyprus and Luxembourg which are countries without NUTS regions.

The main aim of 50 regional reports is to provide a description and analysis of contemporary developments of regional innovation policy, taking into account the specific context of the region as well as general trends. All regional innovation reports are produced in a standardized way using a common methodological and conceptual framework, in order to allow for horizontal analysis, with a view to preparing the Annual EU Regional Innovation Monitor reports.

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¹ <http://www.rim-europa.eu>

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Executive Summary

1. Introduction: Main recent trends in the Regional Innovation System

With approximately 1.9 million inhabitants and 23% of the national population, Stockholm is the dominant city region in Sweden. Between 1997 and 2007, employment increased by roughly 20%, representing almost 30% of the national employment growth.

According to the “European Regional Innovation Scoreboard” in 2006, Stockholm was the top region of Europe in innovation performance. The superior figures for tertiary education (23% of the population) and numbers of researchers (27% of the national total) can be explained by the existence of several major universities within the region, along with a number of specialized university colleges. There is also a high percentage of knowledge intensive business services (KIBS) in local employment (roughly 25%).

In Stockholm, gross expenditure on R&D (GERD) as a ratio of GDP is high (4.3%), particularly in the private sector. This may be explained by the presence of several research-intensive companies, particularly in the sectors of ICT (Ericsson, IBM Svenska and Telia-Sonera) and life sciences (AstraZenec and Pfizer). The high count of patents can be traced to the strong ICT and life sciences clusters present in the region.

2. Major innovation challenges and policy responses

While Stockholm is performing well in a comparative perspective there is still reason to believe that the region does not perform according to its potential. There is no regional innovation strategy or policy in Stockholm and no actor is responsible for innovation coordination. Still, there is a broad range of support measures contributing to the development of the regional innovation system. In most cases, these measures have a broader objective than innovation in itself and are seeking to promote regional growth and development by all means possible. Many support measures are undertaken in cooperation with local, national or international actors.

Challenge 1: Regional coordination

The key challenge is the need for continued development of the regional governance system. Stockholm has a broad competence base for innovation, including a highly skilled labor force and numerous innovative actors from different sectors. However, since there are many strong, independent actors, and no public agency or authority with a mandate to coordinate innovation activities, cooperation has traditionally been limited.

However, recently, several forums for cooperation on regional development have been established. Yet there is still need for improvement. The recently initiated project Innovation Power Stockholm may provide a platform for increased coordination of innovation activities between different forums and stakeholders, and a basis for developing a regional innovation strategy.

Challenge 2: Broader innovation base

Stockholm has a strong innovation structure, based on academic and scientific research, particularly in the ICT and life science sectors. However, the high levels of business R&D and patents in the region are to a large extent traced back to just a limited number of large, global companies, such as Ericsson and AstraZenca, which makes the Stockholm region vulnerable to decisions taken elsewhere. Thus, an important challenge for the Stockholm region is to broaden the base of innovation activities, for example in services and the public sector.

There is already evidence of efforts to broaden the region's innovation base, with several recent initiatives being launched targeting innovation in the services sector. In Stockholm, the service sector, and particularly the knowledge intensive services and the creative sectors, constitute a larger share of the regional economy than is the case in other Swedish regions, which might provide a future opportunity for Stockholm. There have also been initiatives to increase public innovation in the healthcare sector.

Challenge 3: Stimulate human knowledge dynamics

The knowledge created in the Stockholm region does not wholly correspond to the need for business development and innovation. To improve this, a dialogue between the private sector and regional knowledge providers is required. This may become easier in the future, due to the increased focus on development of cluster initiatives in prioritized sectors.

There is also the question of how to attract skills and how to keep skilled individuals in the region. Even if various initiatives to market Stockholm to foreign investors and skilled people have been initiated, it is still a challenge to address the problem of supplying housing and infrastructure, which may otherwise reduce the attractiveness of the region.

3. Innovation policy governance

The overall level of institutional autonomy for regional innovation policy in Stockholm is at a medium level. In Sweden, the national level of government has the main responsibility for funding of research and higher education, while responsibility for basic civil services is administrated at the municipal level. Besides, as a capital region, Stockholm is characterized by a complex institutional setting, with a large number of rather independent actors.

Responsibility for regional development in Stockholm is shared between the County Administrative Board of Stockholm (Länsstyrelsen) and the Stockholm County Council (Landstinget). The County Administrative Board is the government body, responsible for developing a Regional Development Program (RUP). Their level of funding for regional development is low. The County Council is a politically elected regional organization, responsible for developing the Regional Development Plan for the County of Stockholm (RUFSS), focusing on planning, regional (spatial) development and health care. During recent years, the two regional authorities have cooperated in the development of RUFSS 2010, integrating the regional (business) development program (RUP). The process initiated a broad dialogue among many agents, including public as well as private stakeholders at the local and regional level.

In 2007, a national strategy for competitiveness, entrepreneurship and employment 2007-2013 was developed by the government to coordinate various policy areas and increase cooperation between the local, regional and national level. For Stockholm, funding from the European Structural Funds offered the opportunity for implementing publicly coordinated regional development initiatives. Even if the amount of funding was limited, particularly the ERDF programme has had an important impact on policy development since the regional partnership decided to prioritize a limited number of strategic projects.

4. Conclusions: future actions and opportunities for innovation policy

Sweden does not have a national innovation strategy, but regions have been encouraged to develop regional innovation strategies. So far, no regional innovation strategy has been developed for Stockholm. One of the key regional development challenges for Stockholm is the need for regional coordination on innovation activities. Since Stockholm has been performing well, the understanding for the need of public policy measures fostering innovation is sometimes limited. This indicates a need for increased knowledge on the importance of innovation for regional development, as

well as an inclusive process to better understand and develop the role of various actors in the region, as a basis for developing a regional innovation strategy.

According to national guidelines, each region was to develop a regional partnership, prepare decisions and prioritize between different projects in structural funds programmes. To avoid the problems experienced during former ESF periods, the implementation of ERDF in Stockholm has focused on a limited number of larger projects. Due to this, the decisions taken by the partnership have been of strategic importance for the development of the Stockholm region.

Even if Stockholm does not have a specific cluster programme, six of the 16 larger projects prioritized by the partnership for the ERDF in Stockholm may be characterized as cluster development projects. Many of these are found in research intensive, technology based sectors, such as the life sciences, ICT and environmental technologies, but activities have also been directed towards less research dependent sectors, such as the creative sector.

There have also been several interesting attempts to restructure the business and innovation support system of Stockholm. Innovation Stockholm, Entrepreneur Sthlm and ALMI Invest are examples of regional initiatives providing advisory services or early stage funding to entrepreneurs, innovators and small companies. These initiatives have contributed to strengthening the partnerships among actors and building a more structured way of working with advisory services in the region.

1. Main Trends and Challenges in the Regional Innovation System

1.1 Recent trends in regional economic performance

With approximately 1.9 million inhabitants and 23% of the national population, Stockholm is the dominant city region in Sweden. The average annual GDP in Stockholm during the period 2000-2008 was €79.4b, or more than 27% of the national total. Between 1997 and 2007, employment increased by roughly 20%, generating almost 30% of the national employment growth. The geographical borders of the Stockholm NUTS2 level (region) corresponds to the Nuts3 level (län), but Stockholm is also part of the larger Stockholm-Mälardalsregion.

Throughout the 1990s, Stockholm has experienced consistent and impressive growth, while GDP growth in the period 2000-2006 averaged 3.5% (with the per capita equivalent mirroring this trend at 3.2%).

It has drawn on its role as national capital, its research and development strengths, the concentration of advanced business such as logistical and financial services, as well as its specialization in high tech sectors, including biotechnology and ICT. Stockholm also stands out for its high quality of life, as evident in its strong public health performance, high educational attainment indicators and low poverty ratings (OECD, 2006).

While Nordic countries experienced, on average, modest economic growth close to the EU27 average, prior to the economic crisis, large regional differences were evident. Capital regions, such as Stockholm performed considerably better than the EU27 average.

Stockholm (SE11) is, in its own right, a highly heterogeneous region if one is to consider a more detailed regional breakdown. However, some general characteristics are the high percentage of the population with higher education (23%)², the low level of unemployment (6.8% in 2009)³ and a high level of employment in the service sector (85%).

The financial crisis had a significant impact on external demand for small open economies such as the Swedish one, but thanks to strong public finances Sweden was able to cushion the blow and recover rather fast. With a more limited dependency on export industries and a higher level of employment in the services sector, the region of Stockholm was affected the least in Sweden, with peripheral rural areas facing the largest problems⁴. A similar pattern of adaptation and rapid recovery of Stockholm was found after the last two recessions, caused by the downturn in the financial sector in the 1990s and the ICT crises during the 2000s.

According to Figure 1 Stockholm's (SE11) GDP per capita is roughly 60% above EU27 average but growing at a slower pace compared (roughly 10%) to the average. The slower growth of better-performing by no means constitutes evidence of economic under-performance. The unemployment rate in Stockholm (SE11) is correspondingly lower but exhibiting a tendency to approach the EU27 average.

² The percentage is higher at roughly 34% when considering the ratio of highly educated in the economically active population (16-64+) rather than the whole population (see Appendix F)

³ Source: Statistics Sweden. The figure is even lower (roughly 5%) according to Eurostat.

⁴ See Nordregio Report (2010:2) for more details on the economic performance of Stockholm (SE11) and its surrounding regions.

1.2 Recent trends in regional innovation performance

According to the “European Regional Innovation Scoreboard” in 2006, Stockholm was the top region of Europe in innovation performance. In the “European Entrepreneurship Ranking” in 2009, Stockholm was ranked second. Based on these indications, the conditions for innovation in Stockholm appear to be very good. Turning to Figure 1, Stockholm performs well above the EU27 average for each of the five (of eight) innovation indicators where data are available for the Stockholm region.

The superior figures for tertiary education (23% of the population) and numbers of researchers (27% of the national total) can be explained by the existence of several major universities within the region (Karolinska Institute, Stockholm University, Royal Institute of Technology, Stockholm School of Economics), along with a number of specialized university colleges. There is also a high percentage of knowledge intensive business services in local employment (roughly 25%)⁵.

From a national (Swedish) perspective, the research universities and the internationally renowned university hospital of Karolinska in Stockholm receive a major share of total national and international research funding. Approximately 31% of national grants for research funding to higher educational institutions in the Swedish State Budget for 2010 was directed to Karolinska Institute, KTH Royal Institute of Technology and Stockholm University⁶. In 2007-2009, Stockholm’s universities and university colleges received an average of 45% of all funding from the European framework programmes in Sweden⁷.

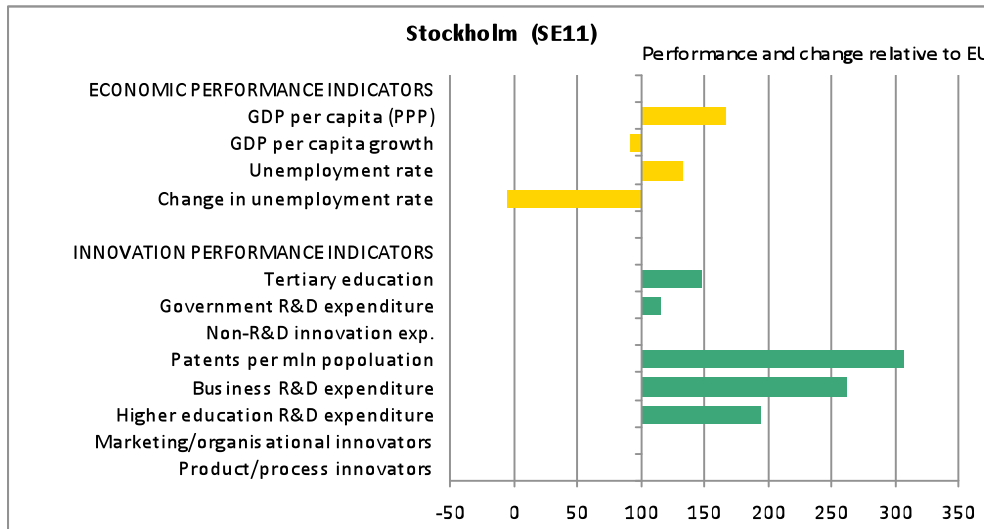
In Stockholm, the gross expenditure in R&D (GERD) as a ratio of GDP is 4.3%, which is higher than both the national average of 3.7% as well as the EU27 average of 1.8% (2003-2006 averages). Moreover, the share of GERD that represents private rather than public investments is higher in the Stockholm region than the EU27 average (72.1% and 63.6% respectively). This high level of expenditure in business R&D may be explained by the presence of several research-intensive companies, particularly in the sectors of ICT (Ericsson, IBM Svenska and TeliaSonera) and life sciences (AstraZenec and Pfizer). The high count of patents can be traced to the strong ICT and life sciences clusters present in the region, coupled with a thriving entrepreneurial culture.

⁵ The figure was calculated based on data from Statistics Sweden and a detailed industrial decomposition at 5-digit level. Eurostat estimations are considerably lower at 10.1%.

⁶ Based on statistics from the Swedish State Budget 2010, Swedish Government, (2009) Förslag till statsbudget 2010, finansplan och skattefrågor, mm. proposition 2010/10:1.

⁷ Based on statistics from the Swedish Agency for Higher Education

Figure 1-1 Economic and innovation performance indicators for Stockholm



Source: Eurostat.

1.3 Identified challenges

However, while Stockholm is performing well in a comparative perspective of economic development and innovation performance there is still reason to believe that the region does not perform according to its potential.

Challenge 1: Regional coordination

The main challenge, raised by most regional stakeholders, is the need for continued development of the regional governance system. Stockholm has a broad competence base for innovation, including a highly skilled labour force and numerous innovative actors from different sectors. However, since there are many strong, independent actors, and no public agency or authority with a mandate to coordinate innovation activities, cooperation has traditionally been limited. In 2006, the OECD Territorial Report of Stockholm criticised the regional governance structure of Stockholm (OECD, 2006).

According to a follow-up on the OECD-study in 2010, the situation has improved in the period since (Stockholm City, National Agency for Economic and Regional Growth, County Council of Stockholm, County Administrative Board of Stockholm, 2010). Several forums for cooperation on regional development have been established, yet there is still need for improvement. First, many initiatives are at an early phase, and it takes time to develop cooperative ventures. Second, there are many different forums, sometimes lacking the necessary coordination from a regional systems perspective. Third, even if the question of innovation is integrated in several initiatives, Stockholm does not have a specific regional innovation strategy.

Challenge 2: Broader innovation base

Stockholm has a strong innovation structure, based on academic and scientific research, particularly in the ICT and life science sectors. However, the high levels of business R&D and patents in the region are to a large extent depending on a limited number of large, global companies, such as Ericsson and AstraZenca. This makes the Stockholm region vulnerable, as decisions that influence its regional innovation potential are often taken elsewhere. Thus, an important challenge for the Stockholm region is to broaden the base of innovation activities, for example into services and the public sector.

Over the last decade, the services sector has expanded rapidly in Sweden and there are ongoing discussions on how to increase services innovation. Two important services

sectors where the Stockholm region has a dominant role in Sweden are the knowledge intensive services sector and the creative sector. Some initial discussions on how to support innovation and development in these sectors have just started and need to be monitored over time. There are also discussions on how to increase innovation in the public sector; for example in health care.

Challenge 3: Stimulate human knowledge dynamics

According to the Lisbon Agenda and the new vision of Europe 2020, the ambition of Europe is to become a competitive and dynamic knowledge-based economy. Generation and exploitation of knowledge is important to create wealth and innovation. However, due to path dependency and the independence of universities and higher education institutions, the knowledge created in the Stockholm region does not wholly correspond to the need for business sector development and innovation.

To improve the correspondence between knowledge provided and the need for competences in the knowledge triangle – including education, research and innovation – an improved dialogue between the private sector and regional knowledge providers is required. This includes the whole system of education for lifelong learning – including basic education, secondary education and vocational training, as well as higher education institutions.

There is also the question of how to attract skills and to keep skilled persons in the region. In the recent past, various initiatives to market Stockholm to foreign investors and skilled people have been initiated. However, due to the rapid growth during the period, Stockholm has seen increasing problems with housing supply and infrastructure capacity, which might reduce the attractiveness of the region to inward investors and the global talent pool more generally. From October 2010, it became mandatory for foreign students to pay tuition fees at Swedish higher education institutions, which may reduce the regional HEIs ability to attract the best foreign students.

2. Innovation Policy Governance

2.1 Degree of institutional autonomy

In Sweden, the national level of government has the main responsibility for funding of research and higher education, while responsibility for basic civil services (e.g. basic education, care for the disabled and aged and child care) is administrated at the local, municipal level (kommun). The main responsibility at the regional level in Stockholm has traditionally been related to public health care, traffic and infrastructure, which have been handled by the Stockholm County Council. Regional authority issues, and to a lesser extent regional (business) development, have been handled by the County Administrative Board of Stockholm.

The overall level of institutional autonomy for regional innovation policy in Stockholm is at a medium level. During recent years, innovation and renewal have become increasingly important in Swedish regional growth policy and responsibility has partly been decentralized to the regional level. Sweden does not have a national innovation strategy, but in the latest government proposition on research and innovation, regions were encouraged to develop regional innovation strategies (Swedish Government, 2009).

Even though a substantial share of national funding for education and research is allocated to actors in the region, funding for regional decisions on business development and innovation in Stockholm is limited (about €0.8 million per year for Stockholm County Administrative Board). Today, all Swedish NUTS3 regions (län) are required to present a Regional Development Program (RUP). In some regions, this plan is supplemented with a voluntary action plan for regional growth (RTP) or a regional innovation strategy. In 2010, several regional innovation strategies had been developed in Sweden, although not yet in Stockholm.

In 2007, a national strategy for competitiveness, entrepreneurship and employment 2007-2013 was developed by the government as a guideline for the regional development programmes (RUP) and the regional structural funds programmes (ERDF and ESF). One ambition was to coordinate various policy areas and increase cooperation between the local, regional and national level. At the NUTS2 level, all Swedish regions have developed Operational Programmes for the European Structural Funds. These strategies have been developed in regional partnership with actors in different sectors, e.g. business, public sector, universities and non-profit organizations.

For Stockholm, funding from the European Structural Funds has offered an increased opportunity for implementing publicly coordinated regional development initiatives. The Operational Programme had a total funding of about €8.5m in Stockholm, which is higher than development funding derived from Stockholm's regional authorities. Even if the amount is limited compared with national funding for research and education performed within the region, the ERDF supported programme has had an important impact on policy development in Stockholm during recent years.

2.2 Institutional-set up, co-ordination and implementation mechanisms

As a capital region, the innovation structure of Stockholm is complex, with many strong yet independent actors in both the public and the private sectors. Various national public entities (government, ministries, research funding bodies and agencies) are also located in Stockholm, which further compounds the complexity of governance in the region.

However, there is no single body responsible for regional innovation in Stockholm and the level of cooperation is still at a moderate level. Responsibility for regional development in Stockholm is shared between the County Administrative Board of Stockholm (Länsstyrelsen) and the Stockholm County Council (Landstinget). The

County Administrative Board is the government body responsible for overseeing national goals, as outlined by the Swedish parliament and government, but is also responsible for developing a Regional Development Program (RUP). The County Council is a politically elected regional organization, which is responsible for developing the Regional Development Plan for the County of Stockholm (RUFSS). It has specific planning and policy responsibilities related to regional (spatial) development, health care, transport and infrastructure.

During recent years, an extensive process has taken place to develop a new RUFSS that integrates the regional (business) development program (RUP) within the broader regional plan. The process was run in cooperation between the two regional authorities, in an open dialogue that included public as well as private stakeholders at the local and regional level. The objective was to develop a shared knowledge platform for strategic discussions and prioritization of activities, including regional innovation support measures. The new RUFSS 2010 was presented and approved by regional politicians in 2010.

During this process, the County Administrative Board and County Council of Stockholm have together taken an increased lead in the development of the regional innovation system. Since there are many actors present in the region, with a local, regional or national focus concerning innovation, a need for increased cooperation was identified. In early 2011, an initiative was taken to make a functional analysis of the innovation structure of Stockholm. The ambition was to invite regional stakeholders into a process to identify needs for development activities and strategic prioritization concerning innovation. The project, Innovation Power Stockholm (Innovationskraft Stockholm), is coordinated by the County Administrative Board of Stockholm, and co-funded by the County Council of Stockholm (€0.55m) and Vinnova, the Swedish National Agency for Innovation Systems (€1.75m).

National agencies and research councils do not have a specific regional perspective on innovation. Still, Vinnova and Tillväxtverket, the Swedish Agency for Economic and Regional Growth, were commissioned by the government to support the development of regional innovations strategies (Swedish Government, 2009). From a national perspective, the Innovation Power Stockholm project was inspired by previous experience on developing regional innovation strategies in other Swedish regions, e.g. Skåne and Västra Götaland. If the project is successful, it may contribute to the future development of a regional innovation strategy in Stockholm. At a national level, initiatives have also been taken to develop a national innovation strategy for the services sector and for regions to create competitive platforms for competence development. In 2010, the County Administration Board was commissioned by the government to develop a competence platform (Competitive Stockholm) to make sure that the Stockholm region attracts and retains people with higher-level skills, knowledge and competences. Further, higher educational institutions have been encouraged to increase their collaboration with the surrounding society and to develop regional innovation offices.

At the international level, Stockholm has previously participated in the European Social Funds programme (ESF), but the period 2007-2013 was the first time Stockholm received financial support through the European Regional Development Funds (ERDF). For Stockholm, the 2007-2013 Operational Programme for ESF has total funding of about €1b while the 2007-2013 Operational Programme for ERDF has total funding of about €8.5m. To prepare decisions and prioritize between different projects a joint partnership was established for both structural funds programmes.

The partnership is made up of policy makers from local (municipality) and regional (Stockholm County Council) level, civil servants from the County Administrative Board of Stockholm, the Employment Agency and the Social Insurance Office, and representatives of the labor unions, Stockholm Chamber of Commerce and a non-profit organization for the social economy in Stockholm. Through this partnership, local and regional stakeholders from different sectors have increased cooperation on regional development in Stockholm.

Based on the experience from former ESF periods, the implementation of ERDF in Stockholm has focused on a limited number of larger projects, to avoid the administrative burden and fragmentation of many small projects. Due to this, a more strategic prioritization of regional development activities has developed, thus indicating that even if the regional dependency on ERDF funding is limited, it has had an important impact on regional coordination. Even if there is no explicit cluster policy in Stockholm, most ERDF projects have been directed towards cluster initiatives in the traditional high tech sectors of life sciences and ICT, as well as new cluster initiatives and in new sectors, such as environmental technology and the creative sector. These sectors are all characterized by a strong regional involvement of public and private actors, as well as a perceived potential for international competitiveness.

In recent years, *life sciences* have received increased attention from regional policy makers. The Stockholm - Uppsala region is one of the leading regions in Europe within research and education in life sciences. The aim, Vision 2025, is to become the world's most attractive center for life sciences. Along these lines, the Stockholm Science City Foundation (SSCI) was founded in 1990 by the three leading universities KTH Royal Institute of Technology, Karolinska Institute and Stockholm University, together with private actors, Stockholm County Council and the municipalities of Solna and Stockholm. SSCI has been commissioned to develop the life science sector around Karolinska Institute (Hagastaden) by attracting academia and business. A number of development projects, including the ERDF project Powerhouse Life Science, are administered by SSCI. In 2010, the Foundation Flemingsberg Science was established in cooperation between KTH Royal Institute of Technology, Karolinska Institute and the University College of Södertörn, the Stockholm County Council and the municipalities of Huddinge and Botkyrka, to develop the life science sector in the south of Stockholm. Besides, two joint initiatives with the Uppsala region have been taken, the first to develop a research center (Science for Life Laboratory), and the second to market the region (SULS).

Another prioritized sector in Stockholm is *ICT*, which is highly concentrated around Kista, in the North West of Stockholm. An important actor for the development of the sector is the Electrum Foundation. The role of the foundation, commissioned by representatives of the ICT sector (Ericsson, IBM, Packetfront), a real estate company, the research institute Acreo, KTH Royal Institute of Technology and Stockholm Municipality, is to stimulate growth and cooperation in research based and innovative growth companies in the ICT sector. The mission is supported by six strategic councils focusing on various aspects, including education, competence development and entrepreneurship, research, marketing and innovation. Operational activities are administered by two subsidiaries; Kista Science City AB and the business incubator STING AB.

Still another priority is the development of the *environmental technology* sector. One strategic initiative in the regional development plan (RUFSS 2010) is the planning and future re-construction of the Stockholm Royal Seaport (Norra Djurgårdsstaden). This is part of an ambitious vision to develop an environmental profile in Stockholm, the 2010 European Green Capital. The project involves a consortium of regional authorities and national agencies, as well as researchers and private companies; and it may become an important platform for developing and demonstrating various innovations in energy and resource efficient building technology. A second initiative is the Stockholm Environmental Technology Centre (SMTC); an association established in 2005 to increase cooperation between business, research and public actors in this growth sector. Among the members are private companies, two non-profit business associations, three municipalities, KTH Royal Institute of Technology and Stockholm Business Region. With co-funding from ERDF, SMTC runs the project Environmental Technology for Growth (Miljöteknik för tillväxt), focusing on the development and internationalization of small and medium sized firms (SMEs) providing solutions for a sustainable future.

Within recent years, various initiatives have been launched to stimulate the development of the *creative sector*. In 2004, the not-for-profit organisation Filmpool Stockholm-Mälardalen (later Filmregion Stockholm Mälardalen) was established to support the film sector in the greater Stockholm area. In 2009, the organization received project funding from the ERDF. Other initiatives have taken place concerning fashion and design. There is also ongoing work to develop an action plan to stimulate development of the creative sector.

As indicated above, cooperation with regional universities and university colleges on education, research and innovation is important for most sectors. During the last few years, participation in regional development and cooperation between the leading universities in Stockholm has developed considerably, partly as a result of an increased demand from the government for collaboration with the surrounding society. Together with business representatives, KTH Royal Institute of technology Technology and Karolinska Institute are active in several cluster initiatives. Many of the universities are also providing different types of support for innovation and commercialisation. Around Karolinska Institute, for example, several measures are available, including a private business incubator (Karolinska Innovation AB), a science park (Karolinska Institute Science Park) and a risk capital company (Karolinska Development AB). There are also the newly established innovation offices at KTH and KI.

Furthermore, 19 universities and university colleges are cooperating on education, student information, marketing, analysis and networking in the Stockholm Academic Forum. Another cooperative initiative to foster entrepreneurship among students is the Stockholm School of Entrepreneurship; a joint initiative between KTH Royal Institute of Technology, Karolinska Institute, Stockholm School of Economics and Stockholm University. SSES is a membership-based, non-profit organization that gathers the innovative and entrepreneurial competencies of all members in a joint education programme. The Unit for Bio-Entrepreneurship (UBE), for example, is an academic unit at the Karolinska Institute (KI) with the mission to inspire, educate and facilitate contacts and interactions for undergraduates and PhD candidates, researchers and clinicians within the fields of innovation and entrepreneurship. Among other activities, UBE provides courses, seminar series and master thesis projects. It is also the Karolinska Institute's node within the Stockholm School of Entrepreneurship (SSES) and the first proactive link with the Karolinska Institute Innovation, a support system for commercialization and technology transfer.

There are also other types of intermediaries, supporting the development of the innovation system of Stockholm, including the regional offices of ALMI Business Partners and the Innovation Bridge, and Stockholm Business Alliance (SBA), a partnership between 50 municipalities in the Stockholm Nuts 2 area and the surrounding Stockholm-Mälardalen region. SBA was established in 2006 in order to coordinate marketing activities of Stockholm under the trade mark "The Capital of Scandinavia".

2.3 Availability and use of policy intelligence tools

As indicated above, policy measures related to competence, innovation and research in Stockholm are often based on a combination of local, regional and national initiatives. As such, innovation is often integrated into various regional development initiatives. Since many of those are partially funded publically, they are subject to regular evaluations in order for public actors to obtain information when deciding whether to develop, continue or discontinue a specific initiative. In some cases, evaluations are publicly available or discussed with regional stakeholders.

Evaluation of previous periods of European Structural Funds programs indicated a limited impact on regional development in Sweden (ITPS, 2004). When Operational Programmes for the ongoing period of European Structural Funds 2007-2013 were developed, the European Commission indicated a need for a more flexible, demand driven approach to evaluation during the program period; it was decided to replace

traditional midterm evaluation with ongoing evaluation (European Commission, 2007). The aim was to improve the potential for a more functional learning process. In Sweden, ongoing evaluation (följeforskning) became mandatory for all larger projects and a guideline was developed by the Swedish Agency for Economic and Regional Growth (Nutek, 2008). In Stockholm, several ongoing evaluation projects have been initiated, but they are still in an early phase.

There is a high level of analytical competence in the Stockholm region. The County Administrative Board in Stockholm and the County Council of Stockholm both have their own analytical services units, providing policy makers with background material for strategic decisions⁸.

The Board and Council have also participated in several stakeholder dialogues to discuss and develop reports on regional development potential. One example was the process of Foresight in the Stockholm-Mälardalen region, a project carried out in 2007-2008 as part of a programme on Urban Development, run by Swedish National Agency for Economic and Regional Growth (Tillväxtverket). More than 200 people from the private and public sector and higher education institutions participated. The process was based on a combination of analysis, seminars and focus groups where issues such as knowledge intensive business services (KIBS), high tech industries, ICT, life sciences and products for the 55+ segment were discussed⁹.

Another example was the project Innovation Place Stockholm-Uppsala that focused on analysis of the growth and innovation potential in the greater Stockholm-Uppsala region. The project was run in 2007-2008 by Stockholm County Council, in cooperation with the County Administrative Board, Regionförbundet Uppsala, the municipalities of Stockholm and Uppsala, and the Swedish National Agency for Economic and Regional Growth. The focus was on physical and strategic planning as a tool for developing innovative environments, involving communication and transport infrastructure, as well as the role of real estate managers and universities (Stockholm County Council/Region- och Trafikplanekontoret, 2008).

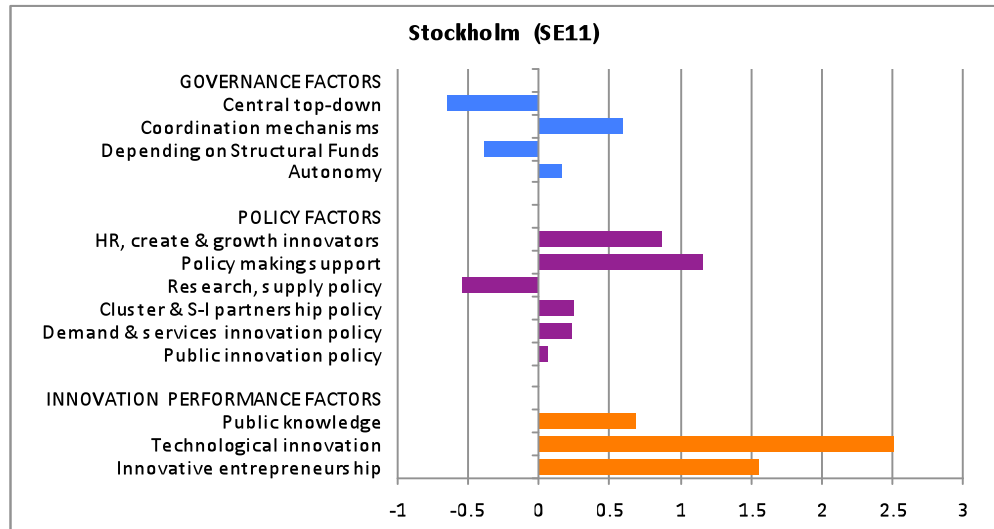
A third example was the process for developing the last RUFSS 2010, when a large number of background reports were produced and discussed in a broad dialogue with local and regional stakeholders. Some of the reports had a specific focus on innovation and provided valuable input into the process.

Apart from public analysis and evaluations, there are also several not-for-profit organizations that provide analysis on business needs and perceived business climates at the local, regional and national level.

⁸ County Administrative Board of Stockholm, (2009) Competitive Stockholm, Stockholmsregionens förmåga till förnyelse och utveckling

⁹ Framsyn Stockholm-Mälardalen – resultat och slutsatser

Figure 2-1 Governance, policy, and innovation performance factors for Stockholm



Source: RIM survey.

2.4 Key challenges and opportunities

As indicated above, the Stockholm region has a strong track record in terms of innovation performance, with a highly skilled labor force, many strong research universities and institutes and several internationally competitive high tech clusters. A large share of national funding for higher education and research is distributed to actors in the region. However, the key challenge concerning innovation policy governance in Stockholm is the need for regional coordination.

In recent years, the Country Administrative Board and the County Council of Stockholm have together taken a more pronounced role in coordinating regional development activities, including initiatives for innovation, competence and entrepreneurship. At the same time, universities such as KTH and KI have increased their involvement in regional development and several forums for cooperation have developed. Even if the focus is not specifically on innovation, questions on competence and innovation are often part of regional development discussions. Some of the forums are partly a result of national and international initiatives. Still, many cooperative initiatives are at an early phase and it is too early to predict the outcome. In comparison with other Swedish regions, the funding available for regional coordination and business development in Stockholm is limited. Besides, since Stockholm has been performing well, the interest in public policy measures fostering innovation has been rather limited. From a political perspective, there is a general expectation that the market will handle these questions.

For the future, it is important for the Stockholm region to broaden the base for innovation to include new sectors, for example the services sector and the public sector. This, in turn, may provide an opportunity for developing new collaborations and governance structures. Traditionally, national as well as regional research and innovation activities have focused on high tech manufacturing industries. In early 2011, a report commissioned by the government, was presented as an input to a future national strategy on services innovation. Since the services sector, particularly the knowledge intensive services sector, constitutes a larger share of the regional business structure in Stockholm than in other Swedish regions, this may provide a future opportunity for Stockholm. Besides, there has been a national trend towards privatization in the Swedish health care sector during the last decade. However, public actors such as County Councils and municipalities are still dominating the funding and the overall provision of Swedish health care. This complicates the question of innovation. First, there is a great potential for using public procurement as a driving

force for innovation, but experience in using it to stimulate innovation is limited. Second, there are few initiatives to stimulate individuals to participate in innovation within the publicly provided health care system. However, Knowledge Navigator (Kunskapslotsen) is a project administered by the Stockholm Academic Forum, with the ambition to stimulate transfer of knowledge between higher educational institutions and small and medium-sized companies in the health care sector.

Another challenge for the Stockholm region is the possibility to create the knowledge dynamics required to compete for competence on an increasingly global market. Today, the level of education in Stockholm is high. Still, one of the major growth obstacles of many firms is lack of competent personnel, indicating a need for a better match between supply and demand for various educational programmes (Nutek - National Agency for Economic and Regional Growth, 2009). According to a recent study by the Employer and Trade Organization for the Swedish Service Sector (Almega), for example, there is a need for more general soft skills, such as project management and cooperating skills among companies in the rapidly expanding services sectors (Almega, 2010). Even if the interest for regional cooperation has increased among representatives of higher education institutions over the last ten years, there are still few formal incentives for business cooperation - in terms of funding or academic qualifications. This indicates the importance of creating platforms for dialogues on the needs for education and competence between private sector and knowledge providers.

3. Innovation Policy Instruments and Orientations

3.1 The regional innovation policy mix

As noted above, there is no regional innovation strategy or policy in Stockholm and no actor is responsible for innovation coordination at the regional level. Still, there are a broad range of support measures contributing to the development of the regional innovation system. In most cases, these measures have a broader objective to contribute to regional growth and development, but questions concerning research, innovation and human resources are often included. Many innovation measures are undertaken in cooperation with local, national or international actors due to the limited amount of regional funding available for business development and innovation. Programmes directed to individuals or companies are seldom launched by agencies at the regional level, but more often by national agencies.

Over the last decade, the potential for *regional governance and horizontal research and innovation policy* has developed in Stockholm. As a result of an increased cooperation between the Administrative Board of Stockholm and the County Council of Stockholm, RUFSS 2010 was developed in a cooperative process that integrated the Regional Development Program (RUP). Further, the implementation of the European Structural Funds is based on prioritizations made by a broad regional partnership. Since responsibility and funding of innovation policy measures among public authorities in Stockholm is limited, many initiatives have been developed in cooperation between actors from the public, private and academic sector. Today, there are several forums established with the ambition to support competence development, research and innovation.

The major policy documents concerning future development in Stockholm is the regional (spatial) development plan, RUFSS 2010, and the Operating Programmes for the European Structural Funds. Yet since the majority of funding is provided from national or international sources neither of these programmes include a specific *research or technology policy*. However, even if Stockholm does not have a specific cluster programme, six of the 16 larger projects prioritized by the partnership for the ERDF in Stockholm may be characterized as cluster development projects. Many of these are found in research intensive, technology based sectors, such as life sciences, ICT and environmental technologies. For example, Environmental Technology for Growth (Miljöteknik för tillväxt), focuses on the development and internationalization of small and medium sized firms providing solutions for a sustainable future. A test facility for research and tests on water purification has been developed, which has received international attention and stimulated company cooperation for internationalization. Further, a test facility and showcase for renewable energy sources has been established in the city of Stockholm. However, cluster activities are also directed towards less research-dependent sectors, such as the creative sector.

Many projects have an ambition to support *creation and growth of innovative enterprises*. Some measures are valuable for all actors in a particular cluster or sector, but the main target groups of publicly co-funded initiatives are individuals and small or medium-sized companies. The above mentioned MedTech Growth is a project to stimulate growth and internationalization in medtech companies. Powerhouse Life Science, administered by SSCI, is a project designed to stimulate business development, new firms, research, innovation, attraction of competence and inward investment in life science.

Important activities for stimulating creation and growth are advisory services and the provision of early stage funding. Innovation Stockholm is a department of ALMI Business Partner Stockholm, one of 19 regional offices of a state owned company. The

organisation is financed by ALMI, Stockholm County Council and Stockholm Business Region, a marketing and tourism company owned by the municipality of Stockholm. Innovation Stockholm offers complementary expert advice and guidance on innovation to individual companies, entrepreneurs and inventors in Stockholm.

Entrepreneur Sthlm and ALMI Invest are two other initiatives, co-funded by the ERDF, that focus on the creation and growth of firms. Entrepreneur Sthlm is a collaborative platform to increase entrepreneurship and innovation by providing support and advice to entrepreneurs, innovators and business owners. ALMI Invest Stockholm is one of seven regional venture capital companies, founded in 2009 by ALMI Business Partner together with regional investors. It receives 50% of its funding from the ERDF. Even if these initiatives do not have a specific focus on innovation, individual innovators and innovative enterprises are invited to participate.

Particularly in high tech sectors the question of *human resources* is of importance for the development of competitive regions. Since responsibility and funding for basic education and training is allocated to the local level (kommun) while higher education funding is directed by the national level, regional policy makers have limited possibilities to influence education and competence development in the region. Similarly, regional universities and university colleges have a great deal of freedom to develop educational programmes in line with the challenges or opportunities they perceive. Notwithstanding this landscape, several regional initiatives have been taken to attract into the region people and organizations with particular types of skills and competence deemed to be in short supply, often as part of activities for developing the regional clusters, e.g. the MedTech growth project and the new initiative Competitive Stockholm, with the purpose to develop competence platforms for discussing competence needs in Stockholm.

There have also been some initiatives from regional universities to influence and contribute to a strong *innovation culture* with positive attitudes towards cooperation. For example, KTH Royal Institute of Technology has taken a strategic decision to participate more in regional development. Since 2005, the KTH management team has run an initiative under the heading “The Entrepreneurial University”. The goal was to raise interest in business cooperation, for example through benchmarking, study visits and cooperation with leading international universities, but also to become more involved in regional development activities. As mentioned, there is also the joint initiative called the Stockholm School of Entrepreneurship (SSES) that stimulates entrepreneurship between students in the region.

Table 3-1 Existing regional innovation support measures

Title	Duration	Policy Priorities	Budget	Organisation responsible	More information
Creative Business Region Stockholm	2009-2011	<ul style="list-style-type: none"> • 4.1.2. Support to innovation in services • 1.3.1. Cluster framework policies • 5.3.3. Support to the innovative use of standards" 	n/a	Stockholm Business Region Development	http://www.stockholmbusinessregion.com/
Entrepreneur STHLM	2008-2011	<ul style="list-style-type: none"> • 4.3.1. Support to innovative start ups incl Gazelles • 4.2.1. Support to innovation management and advisory services 	n/a	County Administrative Board of Stockholm	http://www2.lansstyrelsen.se
Innovation Stockholm	2008-not fixed end date	<ul style="list-style-type: none"> • 4.2.1. Support to innovation management and advisory services • 4.3.1. Support to innovative start ups incl Gazelles 	n/a	Stockholm Business Region Development	http://www.stockholmbusinessregion.com/
Karolinska Institute Innovation	1996-not fixed end date	<ul style="list-style-type: none"> • 4.3.1. Support to innovative start ups incl Gazelles • 4.3.2. Support risk capital 	n/a	Karolinska Institute Innovation AB	http://www.karolinskainnovations.ki.se
Powerhouse Life Science in Stockholm Life Solna-Stockholm	2010-2013	<ul style="list-style-type: none"> • 2.2.2. Knowledge Transfer • 2.2.3. R&D cooperation 	n/a	Stockholm Science City Foundation	http://www.kista.com
STING - Stockholm Innovation and Growth	2001- not fixed end date	<ul style="list-style-type: none"> • 4.3.1. Support to innovative start ups incl Gazelles • 4.3.2. Support risk capital 	n/a	Electrum Foundation	http://www.kista.com/ http://www.stockholminnovation.se/servlet/FileDownloadServlet?id=554
Stockholm MedTech Growth	2009-2012	<ul style="list-style-type: none"> • 2.2.3. R&D cooperation • 4.2.1. Support to innovation management and advisory services • 4.3.1. Support to innovative start ups incl Gazelles 	n/a	Stockholm Business Region Development	http://www.stockholmbusinessregion.com/

Based on the former analysis, there are some regional innovation policy measures that are likely to become important in the future, since they address some of the main challenges of the region.

1. Innovation Power Stockholm (Innovationskraft Stockholm) is a recently launched initiative, run by the County Administrative Board of Stockholm in collaboration with other public actors at regional and national level. If successful, the project may provide a platform for increased coordination of innovation activities between different forums and stakeholders, and a basis for developing a regional innovation strategy.

2. During the last decade, the life sciences sector has become a core economic development strategy in Stockholm. Stockholm Science City Foundation is responsible for administering several projects to develop the life science sector around Karolinska Institute (Norra stations området/Hagastaden), including Power Centre Stockholm Life (Kraftcentrum Stockholm Life). Stockholm Academic Forum is responsible for Knowledge Navigator (Kunskapslotsen), a project to stimulate transfer of knowledge between academia and small and medium-sized companies in the health care sector. Both projects have co-funding from ERDF. Since these projects focus on life science and health care, there is a potential to contribute to broadening the innovation base of the public health care sector in Stockholm.

3. Another sector that has received increased attention in recent years is the creative sector. Creative Business Region Stockholm is a project running between 2009 and 2011 that aims to increased growth and attractiveness in Stockholm by strengthening the culture and creative industries, e.g. design, moving pictures, dance, art and performing arts. The project has a total budget of approximately €1.2 millions, provided mainly by the municipality of Botkyrka and ERDF. In parallel, several initiatives have been taken to develop the film industry, as well as the design and fashion sectors in Stockholm. These projects are interesting since they have a potential to contribute to broadening the innovation base of Stockholm.

4. Environmental Technology for Growth (Miljöteknik för tillväxt) is a 3-year project to stimulate growth and internationalization of small and medium-sized companies providing environmental technology and other solutions for a sustainable development. The project has received international attention and has an interesting potential in the new and growing area of green technology, adding to the environmental profile of Stockholm as the 2010 European Green Capital.

3.2 Appraisal of regional innovation policies

As mentioned, the Stockholm region does not have any explicit regional innovation policies. Rather, the questions of innovation, research and competence development are integrated into other regional strategy documents; mainly the Regional Development Plan (RUFSS 2010). Still, several projects and processes have taken place with an ambition to develop a better understanding of regional innovation capacity. The recently initiated project Innovation Power Stockholm (Innovationskraft Stockholm), which is co-funded by regional and national authorities, may provide a platform for the development of a future regional innovation strategy.

What is interesting to note is the increased cooperation between different stakeholders in the Stockholm region. This may partly be a result of a national demand for increased cooperation, but also a result of the increased globalization and need to develop regional competitiveness in order to compete for funding, skills and investments. Over the last five to ten years, the cooperation between the County Administrative Board of Stockholm and the Stockholm County Council has developed considerably. Similarly, regional universities have developed their cooperation, as they have become increasingly involved in regional development activities.

Since 2007, the strategic decision to focus on a limited number of larger projects with ERDF-funding has also created a need for more explicit prioritization among stakeholders in the regional partnership. Increased prioritization has resulted in a

focus on certain areas of the region, including for example ICT, life science, environmental technology and the creative sector. Even if there is no explicit cluster or innovation systems strategy, many initiatives have similarities with successful cluster initiatives in other regions.

3.3 Good practice case

The period 2007-2013 was the first time Stockholm received part of the European Regional Development Funds (ERDF). According to national guidelines, each region was to develop a regional partnership, prepare decisions and prioritize between different projects in structural funds programs. To avoid the problems experienced during former ESF periods, the implementation of ERDF in Stockholm has focused on a limited number of larger projects. Due to this, the decisions taken by the partnership have been of strategic importance for the development of the Stockholm region.

One of the prioritized projects was Entrepreneur Sthlm, a collaborative platform to increase entrepreneurship and innovation by providing support and advice to entrepreneurs, innovators and small or medium-sized companies in all parts of Stockholm. The project was established as a three-year initiative (2008-2010) by the County Administrative Board of Stockholm, ALMI Business Partner Stockholm, Innovation Bridge and Stockholm Business Region Development. Administration was handled by the County Administrative Board. The total budget over the period was about €4m, supplied by ERDF and the national programme to promote female entrepreneurship at the Swedish Agency for Economic and Regional Growth (Tillväxtverket). Six out of 26 municipalities in Stockholm were participating in the initiative; Järfälla, Sundbyberg, Södertälje, Upplands-Bro, Upplands Väsby and Vallentuna.

The ambition was to develop a coordinated, long-term structure for efficient advisory services and financing, regardless of gender, background, sector or corporate form. In early 2010, Entrepreneur Sthlm set up a panel of 22 delivery organizations to provide advisory services on start-ups, female entrepreneurship, business development, internationalization, innovation (researcher and health care) and mentorship. By using a process of public procurement, service providers were recruited and appointed through open competition. In an effort to make finding the right advice easier all organizations were marketed together at the project website. There, visitors could choose between advisory support concerning start-ups, innovation or business development.

The outcome of the project was positive. A customer survey was undertaken in spring 2010, indicating a high level of participation particularly among women; people aged 40-65, people with a foreign background and small companies (less than five employees). The survey indicated that more than 70% of the participants were satisfied or very satisfied with the services. The demand for services was higher than expected. After the first three years, a total of approximately 17,000 persons had received advisory services and, based on approximations, as many as 2,000 new jobs may have been created (not necessarily full-time) and 3,500 companies established (County Council of Stockholm, 2010). The project also resulted in a strong partnership and a more structured way of working with advisory services in the region. A formal evaluation is presently ongoing.

In 2011, the initiating partners are satisfied with the outcome, but for organizational reason, the project is likely to be split in two parts in the future. Entrepreneur Sthlm, operated by the Country Administrative Board, will continue to provide competitive advisory services in the region. A new organization, StartUp Sthlm, based on the existing organizations Stockholm Startup Center (Stockholm Nyföretagar-Centrum) and Innovation Stockholm (a department of ALMI Business Partner Stockholm), will provide advice in the early phases. Stockholm Startup Center will administer an application for the ERDF 2011-2014, in cooperation with ALMI Business Partner Stockholm and Stockholm Business Region.

3.4 Portfolio of innovation support measures

The Stockholm portfolio consists of a large number of support measures, where regional innovation policy initiatives are intertwined with initiatives focusing on other policy areas, including private as well as academic initiatives, and measures at local, national and international level.

The level of funding for regional development, including research and innovation, from regional sources in Stockholm is very small, compared to other sources of funding. For example:

- Regional development funding through Stockholm Administrative Board (€0.8m)
- National grants for HEI research and research education 2010 (€357m)
- European Regional Development Fund 2007-2013 (€8.5m)
- European Social Fund 2007-2013 (€1b)
- EU RTD Framework program, yearly average 2007-2009 (€43.3m)

Over the last ten years, the Swedish government has issued a number of different policy initiatives to be implemented at regional level. Many of these require cooperation between public actors and other stakeholders at the regional level. Some examples are the guidelines concerning regional development programs (RUP) and European Structural Funds, and the more recent initiative concerning regional innovation strategies and competence platforms.

From national agencies, such as the Swedish Agency for Innovation Systems (VINNOVA) and the Swedish Agency for Economic and Regional Growth (Nutek), strategies to develop regional innovation strategies and clusters or innovation systems initiatives have been encouraged. For several years, these agencies have run different projects to provide regional policy makers with knowledge and support for the development of clusters and innovation systems.

Even if Stockholm does not have a specific cluster programme, several strong cluster initiatives have developed over time. However, the level of public funding from regional actors has often been limited. During the last years, funding has been received through the ERDF programme. Today, there are several ongoing projects related to the well-established high tech clusters of ICT (Kista) and life science (Norra Station and Flemingsberg). In parallel, some new cluster initiatives have developed; for example, related to creative sectors and environmental technology. In most cluster initiatives, actors from private and public sectors as well as academic institutions are collaborating.

Over the last ten years, the national demand for higher education institutions to be involved in regional development activities and commercialization of research results has increased. In the Swedish Higher Education Act of 2009, the expectation is that cooperation in higher education institutions should increase quality in education and research, as well as the use and commercialization of research results on a broad basis. Further, education institutions are required to make yearly reports to the Swedish National Agency for Higher Education (Högskoleverket) on how they cooperate with society. Still, the incentives for individual researchers to participate in cooperation in terms of national funding and academic merits are, in many cases, rather limited. It is therefore important for higher education institutions to find other motives for collaboration with the surrounding society, for example, a greater potential for attracting students and research funding.

In the Research and Innovation Proposition 2008, the Swedish government suggested that Innovation Offices were to be established to stimulate innovation and commercialization of research through qualified advisory services (for example, relating to patenting, licensing and contract research). In 2010 eight universities received funding for developing innovation offices. Two of those offices were located in

Stockholm, at Karolinska Institute (€0.5 million per year) and at KTH Royal Institute of Technology in Stockholm (€0.7 million per year).

3.5 Towards smart specialisation policies

Since Stockholm has been performing well for many years, the interest from policy makers to interfere with market development has been limited. Besides, the level of funding for regional development has been low and Stockholm has often been perceived as part of the national system rather than as a region. When national agencies approached regional authorities in Stockholm in the early 2000s to discuss clusters or innovation systems as a tool for regional development and smart specialization, it became clear that no formal prioritization had been made. In contrast, internationally competitive high tech clusters in ICT and life science had developed with limited interference from the regional level.

Over the last few years, however, the interest in stimulating growth and innovation has increased. This may be a result of demands from national and international actors, but it is also due to an increased awareness of the need to compete in a global market. Besides, the open process for developing the regional development plan RUF2010 and the development of a regional partnership for prioritising among projects of strategic importance for receiving funding from the European Structural Funds has increased the level of cooperation between different stakeholders.

Today, several regional development initiatives have been prioritized in the traditional high tech sectors, such as ICT and life science, as well as in new developing sectors, such as healthcare and the creative sector. At an international level, the introduction of the ERDF in Stockholm has had an important impact, in spite of limited funding. The programme has made it possible to introduce various development initiatives related to the prioritized clusters. Besides, the European Institute of Innovation and Technology (EIT) is an initiative with the ambition to stimulate innovation in Europe by increased cooperation between research, education and innovation. KTH Royal Institute of Technology is a leading part in two out of three winning Knowledge and Innovation Communities (KICs), on ICT and renewable energy. These initiatives are also closely related to prioritised high tech sectors in the Stockholm region.

3.6 Possible future orientations and opportunities

As indicated above, the potential for innovation in the Stockholm region is high. For many years, the region has had a strong innovation performance and a high level of GDP growth. There are many internationally competitive actors, in the private as well as in the public sector.

In recent years, however, globalization and an increased level of international competitiveness have made regional actors more aware of the need to develop competitive regional innovation systems and governance structures. Still, like most large urban regions, Stockholm is characterized by a complex institutional setting, with a large number of rather independent actors. Besides, the resources for regional coordination have been limited. The question of governance and regional prioritizations is therefore of great importance. Several cooperative forums have been developed in Stockholm during the last years, but there is still a need for an inclusive process to better understand and develop the role of various actors in the region.

Traditionally, the Stockholm region has been heavily dependent on a few high tech sectors, such as the life sciences and ICT sectors. However, to remain competitive in the future, several initiatives have been taken lately to broaden the bases of innovation into new sectors.

During the last decades, the services sector has expanded rapidly in Sweden and in Stockholm in particular. Today, the Swedish government is discussing the potential for developing a national services innovation strategy. Two important services sectors

where the Stockholm region has a dominant role in Sweden are the knowledge intensive services sector (KIBS) and the creative sector. Some initial discussions on how to support innovation and development in these sectors have just started and need to be monitored over time.

There are also national discussions on how to increase efficiency and innovation in the public health care sector, in order to handle the challenge of an aging population. This provides an interesting future opportunity to the Stockholm life sciences sector, with internationally established actors such as Astra Zeneca, Karolinska Institute and Karolinska university hospital.

To succeed in global competition, it is necessary to attract and retain relevant competence in the region. During the last years, various initiatives to market Stockholm to foreign investors and skilled people have been initiated. Traditionally, Stockholm has been able to provide a high quality of life, in terms of strong public health performance, high educational attainment indicators and low poverty rating. However, to remain competitive in the future, the challenge of providing housing and infrastructure has to be addressed.

The analysis indicates some areas that need attention also in the future.

- First, it is important to use the ongoing analysis of the Stockholm innovation system to develop a broad dialogue with relevant stakeholders, to identify ongoing activities, needs and roles of various actors and to develop a regional innovation strategy.
- Second, there is a need for developing competence on how to use public procurement as a tool for stimulating innovation and development, for example in the health care sector and for environmental technologies.
- Third, the knowledge on clusters and innovation systems as tools for smart specialization and regional development has to be further developed and spread in the region.
- Finally, there are – well known - regional bottlenecks in terms of housing and infrastructure that have to be addressed in order not to prevent future development of the Stockholm region.

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Appendix B Stakeholders consulted

Göran Reitberger, Senior Advisor, Royal Institute of Technology (date of interview 17 01 2011).

Charlotte Hansson, Analyst, Regional Growth and Planning, Stockholm County Council (date of interview 28 01 2011).

Susanna Rockström, Program Manager Stockholm, EU Regional Structural Funds, Swedish Agency for Economic and Regional Growth (date of interview 01 02 2011).

Göran Andersson, Program coordinator, Swedish Agency of Innovation Systems (date of interview 03 02 2011).

Björn Axelsson, Almega, Project Manager, Almega - employer and trade organisation for the Swedish service sector (date of telephone interview 04 02 2011)

Berit Pettersson, Head of Unit, Unit for Business, Competence and Infrastructure, County Administrative Board of Stockholm (date of interview 07 02 2011).

Maria Lönn, Project coordinator, Unit for Business, Competence and Infrastructure, County Administrative Board of Stockholm (date of interview 07 02 2011).

Folke Snickars, Dean of Faculty, Royal Institute of Technology (date of interview 07 02 2011)

Appendix C RIM Repository information

Appendix D Explanation of factors of Innovation Performance, Governance and Policy

D.1 Innovation Performance Factors

After having normalised all indicators to a common range of 0 to 1, a factor analysis or principle component analysis has been used to identify the main patterns, reducing the eight indicators into three main factors or components of innovation performance. The resulting factors can also be seen as composite or summary indicators.

	Innovation performance factors		
	Innovative entrepreneurship	Technological innovation	Public knowledge
Non-technological innovators	0.91		
Technological innovators	0.86		
Higher education R&D	0.52		
Non-R&D innovation expenditure		-0.84	
Business R&D		0.77	
Patents		0.71	
Government R&D			0.89
Tertiary educated			0.64

The first factor can be labelled as ‘Innovators or **Innovative entrepreneurship**’. It is mostly based on a high score on the share of both non-technological innovators (those introducing market- and or organisational innovations) as well as technological innovators (product and or process innovations) among SME’s in the region. This factor therefore identifies those regions where a large share of all SME’s are innovators.

The second factor is labelled ‘**Technological innovation**’ because it mostly refers to patent generating business R&D with relative low score on non-R&D innovation expenditures as share of their turnover. In regions where this factor shows a high score, technology generating firms are well represented.

The third factor is labelled ‘**Public knowledge**’. This component of innovation performance is based on the co-location of R&D expenditures at government research institutes and to a lesser extent on the share of population with tertiary education.

D.2 Governance Factors

The first distinctive governance characteristic is labelled ‘**Autonomy**’. For regions where the regional innovation strategy is politically binding and containing fixed targets, we also find the highest degree of both general institutional autonomy as well as autonomy regarding innovation policy. In essence, formalisation contributes to the autonomy factor and autonomy is associated with an assessment of innovation policy as effective.

The second distinctive characteristic is named: ‘**Relying on Structural Funds**’. It is based on the similarity in the answers regarding the strategic relevance and significance in terms of funding of EU Structural Funds for regional innovation policy. At the same time these regions report a low level of cooperation with other regions and the innovation system can be characterised as more public-driven.

A third distinctive factor is made up of the similar answers to the two other questions on coordination, namely the existence of vertical and horizontal coordination mechanisms. Finally, a fourth factor is labelled ‘**Central, top-down**’ because they combine a centralised policy delivery and top-down approach in policy design.

	Governance Factors			
	Autonomy	Relying on Structural Funds	Coordination mechanisms	Central, top-down
-How formally binding is the regional innovation strategy document on the regional public authorities ?	.84			
- The general degree of institutional autonomy of the regional authorities in the region	.73			
-To what degree is priority setting, design and monitoring of innovation policy subject to the design and of formalisation of the general set-up of institutions tasked with the development of innovation policy in your region (1=informal, 3= formal)	.68			
- Degree of institutional autonomy of regional authorities in your region with regard to the design and implementation of regional innovation policies	.68			
- How effective is the regional governance process?	.58			
- The relevance of the EU Structural Funds for regional innovation policy, for strategy development		.79		
- The significance of the EU Structural Funds for regional innovation policy, in terms of funding		.70		
- Inter-regional co-ordination projects and mechanisms (e.g. co-operation between agencies in different regions)		-.68		
- Characterise the regional innovation system according to key drivers of innovative activities (1=private, 2=different, 3=public)		.68		
- Horizontal coordination projects and mechanisms between regional players (e.g. inter-departmental working groups, council or multi-sector platforms)			.80	
- Vertical co-ordination projects and mechanisms between local, regional, national and European authorities involved in designing or implementing innovation policy			.73	
- Regional system of policy delivery is centralised (3), mixed (2), or de-centralised (1)				.81
- Design of regional innovation policies follows a top-down approach (as opposed to bottom-up)				.80

D.3 Policy Factors

The first distinctive factor regarding the innovation policies is labelled ‘**Public innovation policies**’. A high contribution to this factor comes from the survey questions regarding: policies for public sector innovation, for open innovation, public procurement, and theme based policies aiming at societal goals.

The second policy factor is labelled: ‘**Demand & service innovation policy**’ because of the co-existence of demand-side policies and service innovation policies.

The third policy factor is named: ‘**Cluster & S-I partner-ship policy**’ since it is based on the frequent combination of Cluster policies and policies promoting new forms of public-private-partnerships for Science-Industry (S-I) co-operation and in addition the implementation of eco-innovation policies contributes to this factor.

The fourth factor is labelled ‘**Research supply policy**’ because it is based on the positive answers to the question on supporting research efforts (the supply side), in combination with an opposite negative answer to the question on ‘market and innovation culture (which is more on the demand side).

‘**Policy making support**’ is the name we have given to the fifth policy, similar to the main indicator. The last policy factor is ‘**HR, creation & growth innovators**’ which combines human capital development with policy aimed at creation and growth of innovative firms.

	Innovation Policy factors					
	Public innovation policies	Demand & service innovation policy	Cluster & S-I partnership policy	Research supply policy	Policy making support	HR, creation & growth innovators
Policies for public sector innovation	.72					
Policies for open innovation	.66					
Public procurement policies	.64					
Theme-based policies aimed at broader societal goals	.62					
Demand-side policies		.79				
Policies for innovation in services		.50				
Support for the internationalisation of innovation policy.		.47				
Cluster policies			.70			
Policies promoting new forms of public-private-partnerships for science-industry co-operation			.61			
Eco-innovation policies			.58			
Innovation related tax policies			.57			
Support research efforts				.74		
Market and innovation culture policies				-.62		
Support to policy making and horizontal policies					-.79	
Support human capital development						.82
Support creation and growth of innovative enterprises						.67

Appendix E Statistical data

Indicator	Stockholm (2000)	Stockholm (2008 or most recent)	EU 27 (2008 or most recent)
Per Capita GDP (in Current EUR)	41,926.7	47,477.7 (2006)	25,131.9
Growth of Regional per Capita GDP (in %)	9.4	4.1 (2006)	0.7
Unemployment Rate (in %)	3.2	5.2	7
Gross Expenditure on R&D (GERD; in current EUR)	N/A	3,929.6 (2007)	237,000.2
Share of Business Expenditure on R&D in GERD (in %)	N/A	74.7 (2007)	63.9
EPO Patent Applications (by Priority Year)	710.69	411.24 (2006)	37,689.12 (2006)
Share of Population Involved in Life-long Learning (in %)	N/A	10.22	9.34
Non-R&D innovation expenditures of all enterprises as a percentage of turnover (normalised scores within a 0 (lowest) to 1 (highest) range)	N/A	N/A	0.41 (2006)

Source: Eurostat and Community Innovation Survey

Appendix F RIM survey responses

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