

Version 13 January 2014

Regional Innovation Monitor Plus

Regional Innovation Report (West Sweden)

To the European Commission

Enterprise and Industry Directorate-General

Directorate B – Sustainable Growth and EU 2020

Regional Innovation Monitor Plus

Regional Innovation Report (West Sweden)

technopolis _[group] in cooperation with



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PREFACE

Launched in 2010, the Regional Innovation Monitor¹ continues to be one of the flagship initiatives of DG Enterprise and Industry of the European Commission. From the outset, it aimed at supporting sharing of intelligence on innovation policies in some 200 regions across EU20 Member States.

RIM Plus aims to help regions to improve their innovation policies based on better and harmonised policy intelligence. The new contract aims to contribute to the development of more effective regional innovation policies and promote policy learning.

Building upon the experience gained and results obtained during the implementation of the RIM in the period 2010-2012, the RIM Plus service evolves towards providing practical guidance to regions on how to use the collected information, establishing a network of regional experts with thematic specialisation, and organising specialised workshops taking into account the relevance and potential interest among the regional innovation policy makers.

RIM Plus 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 30 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 standardised 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 Plus report.

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The present report was prepared by Ingrid Helene Garmann Johnsen (ingrid.johnsen@nordregio.se) and Christian Fredricsson (christian.fredricsson@nordregio.se). The contents and views expressed in this report do not necessarily reflect the opinions or policies of the Regions, Member States or the European Commission.

The Regional Innovation Access Point and Knowledge Hub presenting further details of the regional innovation measures, policy documents and regional organisations in West Sweden is accessible through the RIM Plus online inventory of policy measures here: <http://ec.europa.eu/enterprise/policies/innovation/policy/regional-innovation/monitor/region/select>

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¹ <http://ec.europa.eu/enterprise/policies/innovation/policy/regional-innovation/monitor/>

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Executive Summary

1. Main Trends and Challenges in the Regional Innovation System

West Sweden is a strong growth region both from a national and European perspective, with an internationally competitive industry in different sectors. The region has strong clusters with adjustment and development capability, large investments in industries that strengthen competitiveness, strong research and innovation environments, large R&D investment and many patents. As such, the regional innovation system is generally varied and well-functioning with a regional structure that is well integrated. However, there are still challenges that should be addressed, especially when it comes to regional coordination of support efforts and the high share of research and development efforts that are concentrated in large companies, which makes the region vulnerable.

Challenge 1: Increase collaboration between actors in the region

Industry invests heavily in R&D; however, it is the larger companies within the areas of automotive, pharmaceuticals and ICT that account for the larger part of these figures. Smaller companies in the region, on the contrary, do not invest much in R&D. This makes the region vulnerable, and suggests that there is a large potential to increase collaboration between industry, universities and SMEs.

It is necessary to encourage and extend the existing relationship between universities and other stakeholders in the regional innovation systems, especially technology centres and the private sector, so that a clear common thread exists between research and the world of private-sector innovation.

Challenge 2: Stimulate entrepreneurship and innovation in SMEs

New firms and innovative SMEs are playing an increasing role as drivers of growth and job creation in the economy. However, West Sweden has a low number of new businesses compared with the national average, and the region risks losing companies with growth potential if it cannot support their development.

To fulfil their potential for job creation and long-run growth, there is a need to develop the support system and ensures a business environment that stimulates entrepreneurship and innovation in SMEs.

Challenge 3: Upgrade traditional industry

Manufacturing industry has a significant presence in West Sweden compared to the country's other metropolitan areas, and Västra Götaland is a center of industry, trade and logistics. A key challenge is how to restructure the traditional industrial base to comply with the knowledge-intensive economy. This is necessary in order to be able to compete effectively in the integrated European context and the global market.

2. Innovation Policy Governance

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 the elderly and child care) is administrated at the local, municipal level (kommun). During the last decade, responsibility for regional development has to an increasing extent been decentralised to the NUTS 3 regions (län), i.e. counties. Traditionally responsibility was shared between County Administrative Boards (länsstyrelsen), representing the national government at a regional level, and Regional County Councils (landsting). Over time, other types of directly or indirectly elected organisations for regional development have developed. Since 2007, Regional Development Councils have been developed in 14 NUTS 3 regions, including region Västra Götaland.

The Region Västra Götaland is part of the larger national innovation system and the regional governance structure is a mixture of public and private initiatives, involving actors at different levels. To involve various actors, several clusters and cooperative platforms have been established. A Structural Funds programme has been developed for the region. Besides this, the governance structures of the NUTS 3 regions Västra Götaland and Halland are different and have not been integrated.

In Västra Götaland, the autonomy concerning regional innovation policies is high. Region Västra Götaland (VGR) is controlled by a politically elected regional council and has the overall responsibility for regional development. This includes health care, development and implementation of a regional development programme (RUP), including measures linked to lifelong learning, stimulation of research and innovation, infrastructure development, as well as implementation of the EU Structural Funds programme. Another important actor in Västra Götaland is Business Region Gothenburg (BRG), a non-profit organisation representing 13 municipalities with the mission to contribute to regional development.

3. Innovation Policy Instruments

At the NUTS 2 level there is no common regional innovation strategy for West Sweden. However, at the sub-regional level public support for innovation and entrepreneurship is treated addressed in the Growth Programme for Västra Götaland 2008-2013. The region has already launched a new strategy for growth and development that will be implemented from 2014: Västra Götaland 2014-2020 (VG2020).

Several projects and processes have taken place with an ambition to develop a better understanding of regional innovation capacity. The regional policy is executed in alignment with national policies and in smart synergy with the European policies and funding instruments for cohesion, research and innovation. The regional innovation and growth strategy supports business innovation, innovations systems, R&D programmes and excellence centres, start-up companies (seed funding, VC), communications infrastructure and cultural institutions.

In addition to the regional growth programme there are four sub-regional growth programmes for Fyrbodalen, Göteborg, Skaraborg, and Sjuhärads. The local authorities are responsible for coordinating the implementation of the sub-regional growth program, in collaboration with stakeholders, to initiate, implement and participate in funding of programs and activities in development priority areas. The regional growth programme also includes an RTD and innovation strategy which resides on three pillars: Entrepreneurship, Innovative SMEs, RTD investments and clusters. It combines relevance and excellence, targeting key industrial innovation and research areas in the region such as: Automotive/Air Transport, Health/ Biomedicine, Energy, Maritime Sector, Creative Industries and New Materials.

Under the Growth Programme there are a number of support measures that target different industries in the region. One such target area is the Automotive/Air Transport industry. InMotion programme, which was established in 2008, is focusing on promoting sustainable transformation and development for transport solutions and energy systems. An example of other cluster initiatives in the region is Smart Textiles, which aims at promoting growth, strengthen the international position and create new job opportunities in the textile industry.

4. Conclusions: future actions and opportunities for innovation policy

The economy in West Sweden is characterised by a number of strong growth areas where the region has specific competitive advantages in an international perspective. The region has had a strong innovation performance and a high level of GDP growth. However, there are several opportunities for further development in order to further develop competitive regional innovation systems and governance structures. West Sweden's future as knowledge-driven region requires innovation and is based on continuous development of knowledge, skills and the effective use of resources.

- **Higher education and research and open innovation platforms**

Universities and other institutions of higher education should maintain a high international standard, and cooperation between companies and institutions of higher education is crucial for innovation and competitiveness.

- **Access to research network for SMEs**

One main focus of Region Västra Götaland is to create easy access to research networks for SMEs. The region has been working on developing a new type of RTD and innovation vouchers for SMEs. One example is the programme 'Industrial Dynamics' which aims at supporting SMEs in technology development, business and market development, and finding the right paths within the EU instruments and initiatives, and access to the combined expertise of 12 prominent expert organisations ranging from universities to research institutes and industrial development organisations.

- **Clusters and smart specialisation**

It is important to develop long-term strategies that strengthen the existing clusters in the region. Smart specialisation is also a priority in the regional strategy for Västra Götaland (VG2020). Smart specialisation has been and will continue to be an important policy tool for regional authorities, and continued participation in initiatives such as CROSSTEXNET will help strengthen the key business sectors and existing clusters. Furthermore, by strengthening the synergies between regional, national and European strategies and instruments such as structural funds, EU research programmes and regional and national R&D programmes, this will help build smart, competitive clusters.

- **Leadership**

Several of the regional stakeholders emphasise the need for stimulating an 'ecosystem' where there are clear leaders. The science parks in the region make up an important infrastructure to implement the Research and Innovation strategy where businesses, universities, institutes and public bodies set their agenda jointly and participate in the implementation of actions and initiatives. However, as a next step, these science parks should be given a clearer mandate as "leaders" within their respective areas of expertise. A clearer leadership among the strategically priority areas in the region would help strengthen coordination efforts and create even more favourable conditions for a globally competitive industry.

- **How do the future orientations co-work with the identified challenges?**

With regards to increased collaboration between actors in the region it is clear that through the clusters and smart specialisation initiatives there is a strong focus on strengthening the regional competitiveness through cooperation between regional (and national) actors. Furthermore, initiatives such as RTD and innovation vouchers for SMEs are further strengthening regional collaboration.

The focus of Region Västra Götaland to create easy access to research networks for SMEs also shows that there is an emphasis on stimulating entrepreneurship and innovation outside of the large multinational companies that are present in the region. Such initiatives will help broaden the knowledge base and thus strengthen the innovative capability of the region.

Last, with regards to upgrading the manufacturing industry, this can further be done through the cluster initiatives and through broader collaboration between regional actors (e.g. industry, academia and science parks). Overall, regional development in West Sweden will be dependent on strengthening traditional knowledge base as well as stimulate entrepreneurship and innovation in new areas.

1. Main Trends and Challenges in the Regional Innovation System

1.1 Recent trends in economic performance

The NUTS 2 regions in Sweden do not always correspond to traditional geographical or economic regions. The NUTS 2 region Västsverige (West Sweden), with approximately 1,900,000 inhabitants, consists of two relatively independent NUTS 3 regions. In 2012, the larger Västra Götaland region had a total of around 1,600,000 inhabitants, including Sweden's second largest municipality Gothenburg (526,000 inhabitants)². The smaller Halland region had approximately 304,000 inhabitants. Average gross domestic product (GDP) during the period 2000-2010 was SEK536,600m (€60,099m), or close to 19% of national GNP³. Most sectors of the Swedish economy were represented in the region, except for some parts of the financial sector, which are focused to Stockholm, and certain sectors related to natural resources. In 2008, the percentage of gross value added (GVA) in manufacturing industry (about 30%) and wholesale/retail (about 20 per cent) was above the national average⁴. The GDP per capita in West Sweden in 2010 was €35,300, well above the EU27 average, but the 2.61% growth in GDP per capita between 2000 and 2010 was lower than the EU27 average (Figure 1). In 2009 the region experienced a negative GDP growth rate, however, already in 2010 the region experienced much higher GDP growth than the EU27 (19.8% compared to 4.5% respectively) (Figure 1).

West Sweden has a unique geographical position on the West Coast between the metropolitan regions Oslo and Öresund. Gothenburg is the main metropolitan area in the region. The population in West Sweden has been growing steadily for a long time. Population increases primarily in the coastal area with a clear concentration in the Gothenburg region and Halland. The tendency is that the populous towns, and metropolitan areas in particular, are becoming more attractive at the expense of smaller, more peripheral and industry-dominated parts. It is primarily Dalsland and the northern parts of Skaraborg but also the southern part of Sjuhärad that are experiencing decline in the population.

A large proportion of the total population growth in Sweden the last ten years is due to an increase in the number of persons born outside the Nordic countries. The proportion is expected to increase further. The percentage of inhabitants born abroad is 14.6% in Västra Götaland and Halland, below the national average, but 23% in the municipality of Gothenburg⁵. Residents who were born outside the Nordic countries primarily live in the region's major cities. The largest share is in the city of Gothenburg, with a particularly high concentration in certain neighbourhoods. Other municipalities with a relatively large proportion of residents with foreign backgrounds are Trollhättan, Borås and Halmstad. The share of the population aged 25-64 with a 3-year tertiary education in Västra Götaland corresponds to the national average of 25%, but is lower in Halland⁶.

The economy in West Sweden is characterised by a number of strong growth areas where the region has specific competitive advantages in an international perspective. Port of Göteborg is Scandinavia's largest port with trans-ocean and intra-European shipping lines. The Gothenburg area is the hub of the Nordic transportation system and half of Sweden's import/export goes through the area. The region is attractive to foreign investment, and it has a significant number of foreign-owned firms.

² RIM repository (2013)

³ Ibid.

⁴ Ibid.

⁵ Ibid.

⁶ Region Västra Götaland (2013d)

Companies like Volvo, Saab, Astra Zeneca, SKF and Ericsson are all present in the region, while there is also a large share of SMEs present.

The amount and quality of knowledge circulating and spilling over between firms, located in a cluster, is dependent upon the cluster's size, the degree to which it is specialised and the extent to which the locality (the region) is focused upon production in the relevant industries comprising the cluster⁷. According to the European Cluster Observatory, the automotive cluster has a particularly strong position in the region. However, while the automotive cluster in West Sweden has been the strategic growth area before the financial crisis, food processing, ICT, energy, biotechnology, pharmaceutical and medical technology are now selected areas that have strong development potential.

Foreign trade has been important for development and prosperity, and the region is highly dependent on internationalisation. West Sweden as a whole is more dependent on industry than the national average. Only in Gothenburg and Halland is the industry proportion in line with the national average. Industry is the sector that is most over-represented in three of the West Sweden sub regions. For instance, in Skaraborg there is almost ten per cent higher share of industrial employment than the national average. Financial services and other business services are underrepresented in West Sweden as a whole; however, Gothenburg has a higher share than the national average.

The industrial structure in West Sweden is made up of interlinked and integrated production systems that are influenced by international competition. However, while globalisation creates new opportunities for the development in the region, traditional manufacturing jobs are particularly vulnerable. This is true for areas such as Dalsland and parts of Skaraborg, where the industrial structure is characterised by external dependence and relatively standardised production in larger units. One major challenge is to restructure the traditional manufacturing sector to comply with the competitive reality of the knowledge economy.

West Sweden has had strong growth both from a national and European perspective, with a strong and internationally competitive industry. The automotive cluster has been especially important for creating jobs in the high tech industry, automotive industry, and the service sector. However, because of its reliance on export and the importance of the automotive industry, the region was hit hard by the financial crisis. Between 2008 and 2009 annual exports decreased by 24% in Västra Götaland, compared with 14% in Stockholm⁸. Despite this, Västra Götaland was the county with the highest share of exports in 2009 compared to the rest of Sweden; in 2009 the country exported goods for almost SEK227b (€25.4b)⁹. As a result, the region is investing heavily in research that produces results in the form of new products and jobs.

The average level of unemployment in 2012 was close to the national average in Västra Götaland (8.0%), but as low as 6.4% in Halland¹⁰. Regarding employment distribution between sectors (2011), 48% of the workforce is employed in knowledge intensive services, while employment in medium-high and high-tech manufacturing is 6.5% (Figure 1). To strengthen regional resilience, attention to services sectors has increased; however, employment in these sectors is still below the national average (Figure 1). Employment in high tech industries and knowledge intensive services is high compared to the national and EU27 average. The total R&D personnel accounts

⁷ European Cluster observatory (2011)

⁸ West Sweden Chamber of Commerce (2010)

⁹ Government Offices of Sweden (2010b)

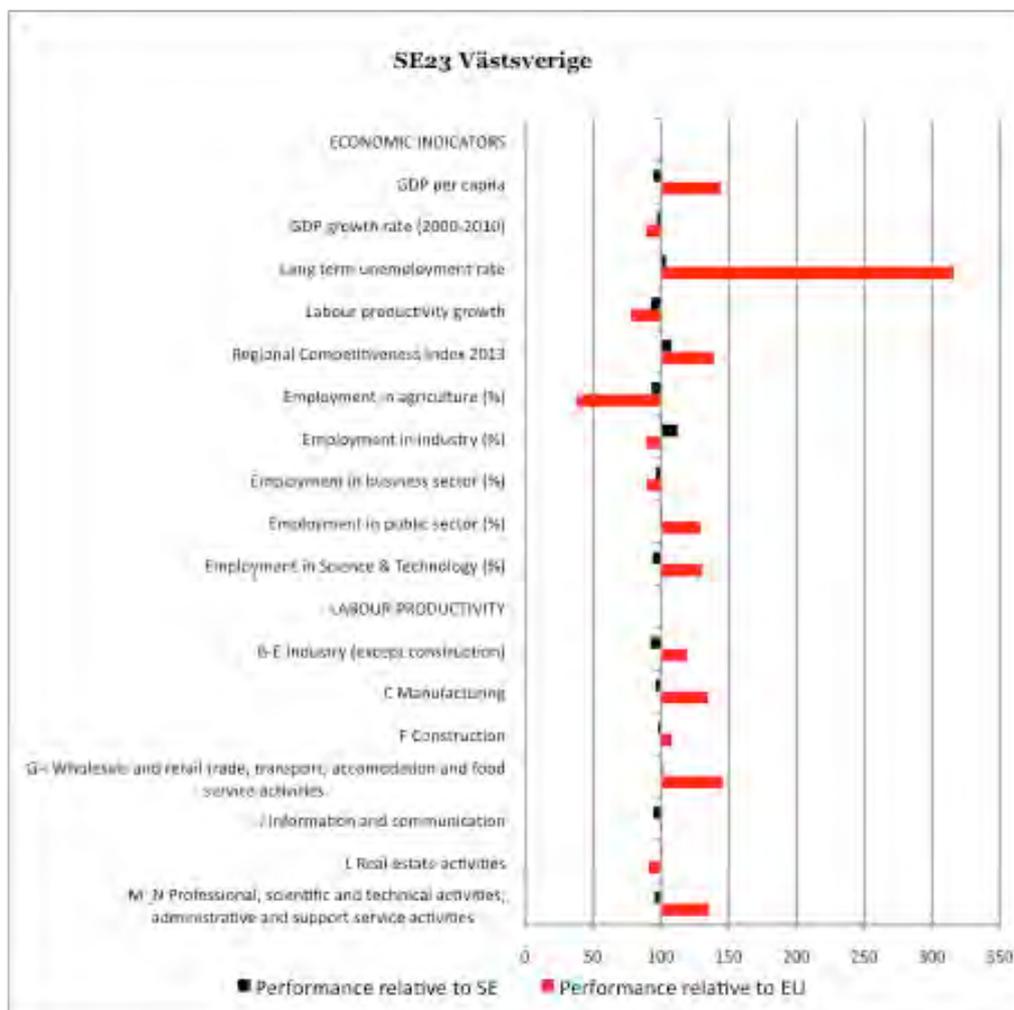
¹⁰ RIM repository (2013)

for 2.49% of the active population in West Sweden, compared to only 1.53% in EU27 (Figure 1).

The differences between various parts of West Sweden are significant and have been growing in recent years. While more jobs are created for a growing and much younger population in the Gothenburg region, Halland and the larger cities, these areas also experience more of the so-called urban problems of exclusion and segregation. In some parts of the region, development is considerably weaker. There are a number of municipalities in more peripheral areas where the development is significantly more negative for several indicators that describe e.g. population and employment development, education, unemployment and health. When it comes to breaking the ethnic and economic segregation, this is a problem in all major cities in the region. The structure of the labour market in West Sweden also poses special challenges for women. Indicators show that women have lower income, and that a higher the share of part-time workers are women. Furthermore, the economic and ethnic segregation in the region is too big, and there the level of people who are excluded from the labour market on a long term basis is too high.

Västra Götaland runs a comprehensive programme to support the work of the region's development and growth, including through efforts to strengthen the regional innovation system. An important part of a functioning innovation system consists of the actors with the public funding provides support for the development of innovation and entrepreneurship in the region.

Figure 1 Economic performance indicators



Source: Eurostat

1.2 Recent trends in regional innovation performance

According to the European Regional Innovation Scoreboard 2012, Sweden belongs to the innovation leaders, with an innovation performance well above that of the EU average¹¹. Sweden is one of the countries with the highest proportion of research in terms of GDP, and the majority of the investments in research and development (R&D) are made by industry. West Sweden, and Västra Götaland in particular, is one of the fastest growing European regions, and by international standards, the region is characterised by a high level of R&D expenditures by businesses (Figure 2). Therefore, regional policy focuses on strengthening the industry's ability to stay innovative and globally competitive, while mastering the transformations needed to meet societal challenges as a result of global economic crisis, social unrest and climate change. The region's future competitiveness and attractiveness for innovation, knowledge intensive production and R&D is one of the most prioritised issues for policy.

West Sweden is consistently high in terms of innovation. When comparing the number of patents, the number of R&D employees and R&D expenditure the region is ranked as number six out of 214 European regions¹². In a more recent survey from 2012, West Sweden, together with Stockholm, are ranked among the leading regions when it comes to conditions and outcomes of innovation in the economy¹³. The factors assessed are human capital in science and technology, scope of training and lifelong learning, jobs in medium and high-tech manufacturing and service, amount of R&D spending from the public and business, and patent applications in relation to the population base.

Between 2000 and 2005, employment in West Sweden increased in all sectors except manufacturing, which fell with more than 8,000 jobs¹⁴. Industrial employment decreased most in Fyrbodalen (-4,486) followed by Sjuhärads (-2,690) and Skaraborg (-2194) while it increased slightly in the Gothenburg region and Halland¹⁵. The largest increase in employment was accounted for in the services sector, and in 2011 47.66% of the total employment in the region was in knowledge-intensive services (Figure 2). This is still below the national average but considerably above the EU27 average. Out of the active population, a relatively high share, compared with the EU27, was R&D personnel. However, the share of employees with tertiary education is about the same as the national average (Figure 2), which indicates that industry still accounts for a considerable share of the employment in the region.

The impact of small business on employment varies within the region. In Halland 53.4% work in small businesses, and in West Sweden as a whole the number is 45.5%¹⁶. The presence of many small businesses favours flexibility and adaptability to change, and creates a positive attitudes toward entrepreneurship. However, while the small businesses in the region are generally profitable, the willingness of these businesses to grow is relatively weak. Also, small businesses have little or no contact with universities and research institutes and often lack their own resources for development.

Conditions for innovation in West Sweden are good and there is a comprehensive support structure to promote entrepreneurship and innovation. R&D intensity is high also in a global perspective; the annual business R&D expenditure is more than three times the EU average (3.3% of GDP in 2011 compared to 1.2% in EU27) (Figure 3). However, government investment in R&D is well below the EU average; in 2010

¹¹ European Commission (2012)

¹² Swedish Agency for Economic and Regional Growth - Tillväxtverket (2011b)

¹³ European Commission (2012)

¹⁴ Region Västra Götaland (2008d)

¹⁵ Ibid.

¹⁶ Region Västra Götaland (2006)

government R&D only made up 0.1% of GDP, compared to 0.2% at the national level and 0.3% in the EU27 (Figure 3). In comparison, higher education R&D expenditure is considerably higher in West Sweden at 0.8% of GDP compared to the EU27 average of 0.5% (Figure 3). The business innovation indicators also show that the percentage of innovative SMEs collaborating with others is higher in West Sweden than at the national level and EU27 (figure 6). The regional also has a higher share of technological (product or process) innovators and non-technological (marketing or organisational) innovators compared to EU 27 (Figure 6).

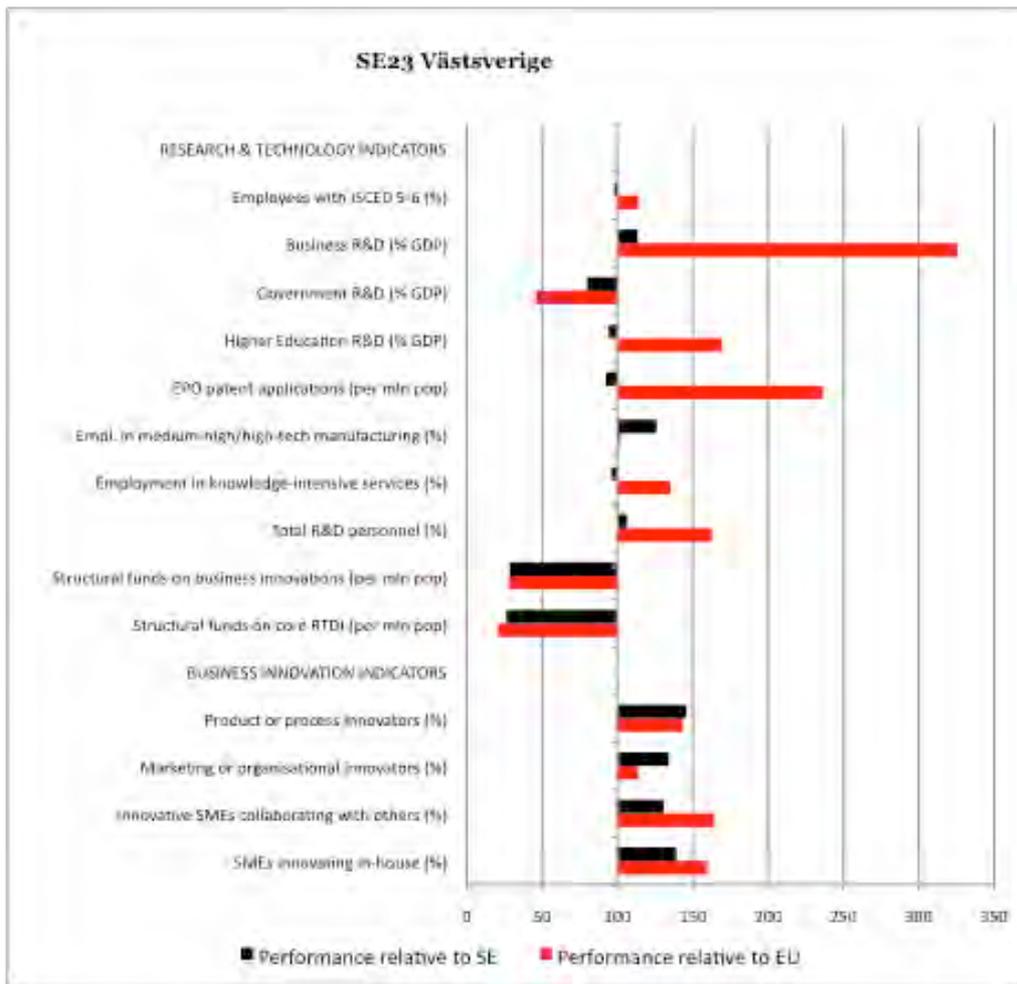
Two important sectors are automotive manufacturing and trade. Other key sectors have been prioritised in the regional development process, e.g. life science, tourism, food processing, textiles, ICT, the petro chemical industry, environment/energy and maritime industries. Several of these are part of national R&D, innovation systems or cluster programmes, e.g. Smart textiles, GöteborgBio and Hälsoteknikalliansen. There are some large multinational firms headquartered in the region, like Volvo and Astra Zeneca, but due to an increased share of foreign ownership, the region is relatively vulnerable to external decisions. It is on average the business in the region that spend most on R&D measured in euro per inhabitant (Figure 3). This number has consistently been higher than both the national and EU27 average; however, expenditure slightly decreased between 2004 and 2010 (Figure 3).

The innovation support structure consists of a variety of organisations and measures to support the development of innovations and business ideas from the conceptual stage through to market launch. Many of the organisations work closely with higher education. However, measured in euro per inhabitant government R&D expenditure is much lower than EU27 on average (figure 3), and higher education R&D expenditure is still below the national average (Figure 3)

To stimulate innovation, a number of platforms have been established in cooperation between public and private stakeholders, e.g. Sahlgrenska Science Park, Lindholmen Science Park and Johanneberg Science Park in Gothenburg, Innovatum in Trollhättan, Espira in Borås and Gothia Science Park in Skövde. During the past ten years a large number of technology-based companies have emerged in the region, often through university-based incubators, and with the support of seed capital. Many successful examples exist, such as the foundation Chalmers Innovation, which has contributed to the development of a considerable number of new technology-based companies.

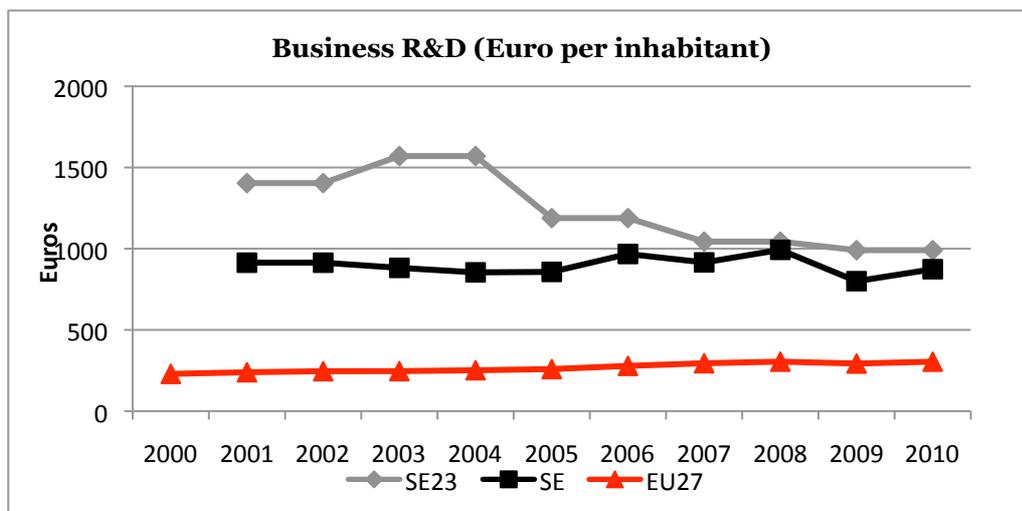
The European Structural Funds Programme that has been running from 2007 to 2013 has largely focused on business incubators in order to increase survivability and innovation in start-ups. One successful example is investments in health technology in Halland. This is in line with the regional R&D scheme which is realised through specific research areas with internationally competitive programs based on partnerships between industry, research institutions and public bodies. However, the amount of structural funds spent on business innovations and core research, technological development and innovation is very low in West Sweden compared to the national level and the EU27 (€12.99 per million population compared to 49.44 and 63.01 respectively) (Figure 2).

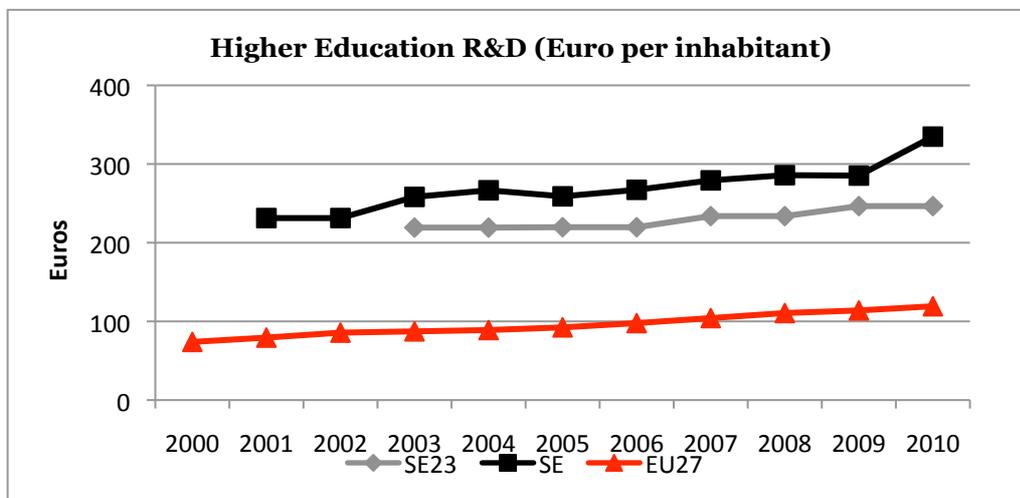
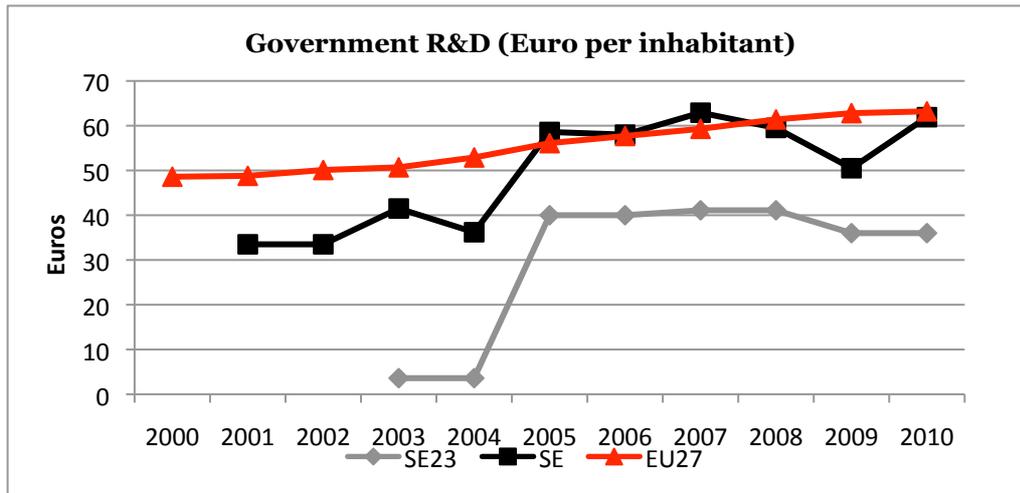
Figure 2 Innovation Performance Indicators



Source: Eurostat

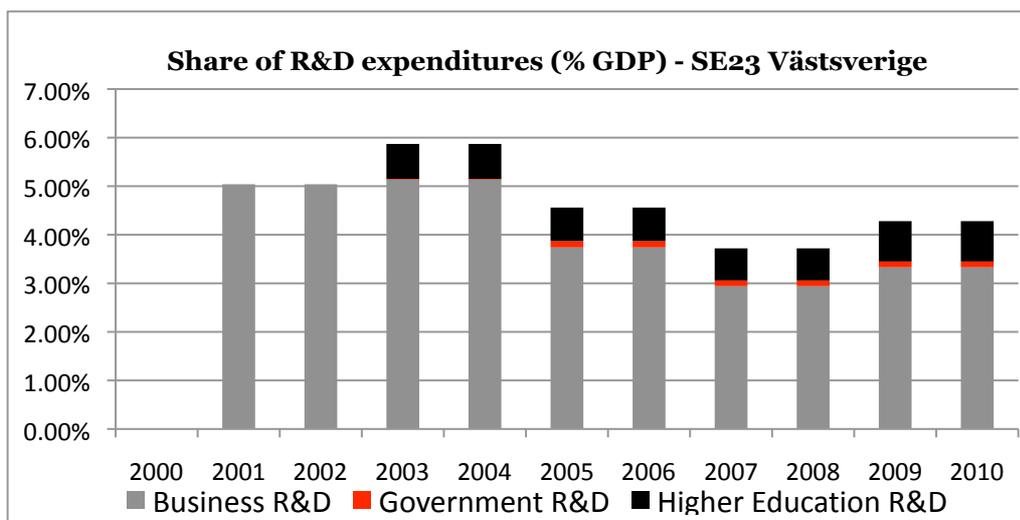
Figure 3 R&D expenditure per sector of performance





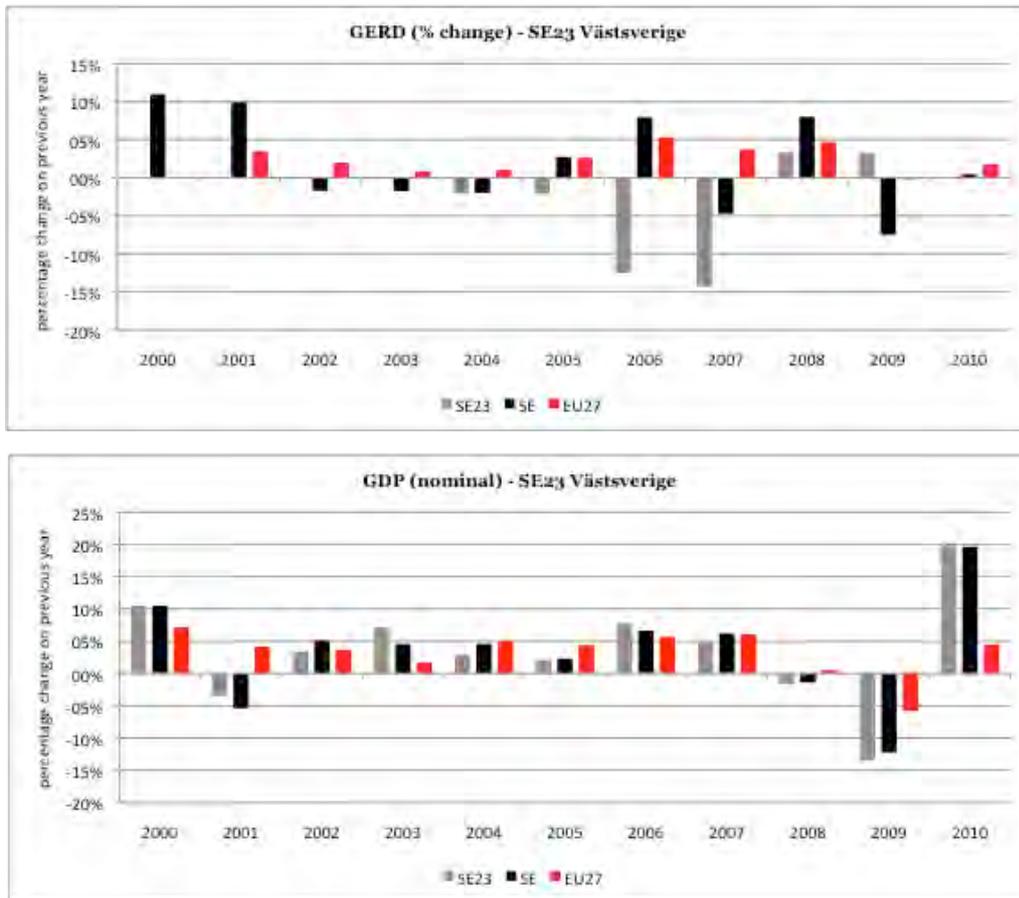
Source: Eurostat

Figure 4 Share of R&D expenditure per sector of performance



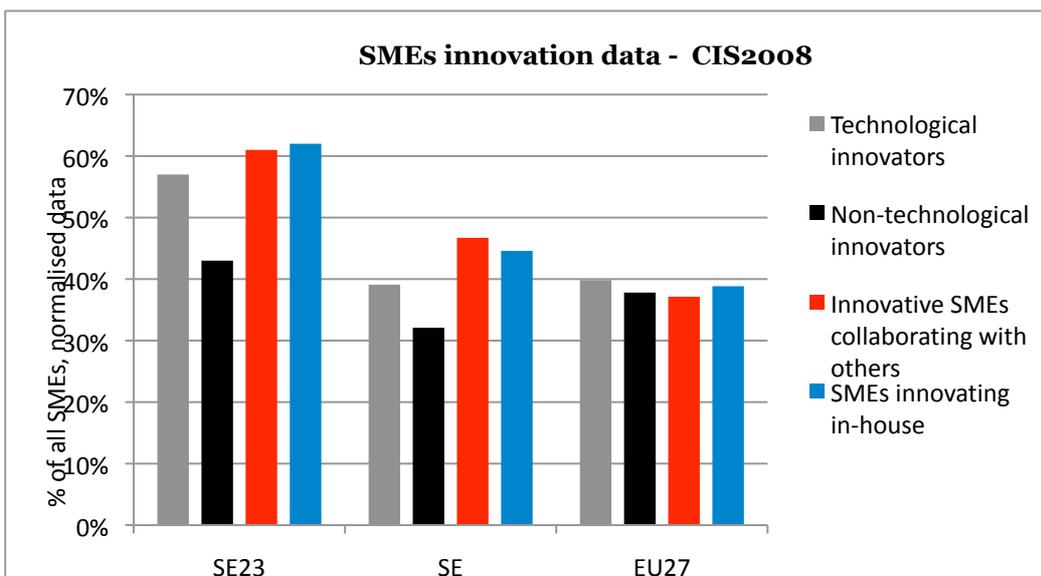
Source: Eurostat

Figure 5 GERD and GDP trends



Source: Eurostat

Figure 6 Technological & non-technological innovators



Source: Eurostat

1.3 Identified challenges

West Sweden is a strong growth region both from a national and European perspective, with an internationally competitive industry in different sectors. The region has strong clusters with adjustment and development capability, large investments in industries that strengthen competitiveness, strong research and innovation environments, large R&D investment and many patents. As such, the regional innovation system is generally varied and well-functioning with a regional structure that is well integrated. However, there are still challenges that should be addressed, especially when it comes to regional coordination of support efforts and the high share of research and development efforts that are concentrated in large companies, which makes the region vulnerable.

Challenge 1: Increase collaboration between actors in the region

Industry invests heavily in R&D; however, it is the larger companies within the areas of automotive, pharmaceuticals and ICT that account for the larger part of these figures. Smaller companies in the region, on the contrary, do not invest much in R&D. This makes the region vulnerable, and suggests that there is a large potential to increase collaboration between industry, universities and SMEs.

It is necessary to encourage and extend the existing relationship between universities and other stakeholders in the regional innovation systems, especially technology centres and the private sector, so that a clear common thread exists between research and the world of private-sector innovation. For this, steps must be taken to encourage research oriented towards the business community. An alternative is to increase cooperation between universities along with their associated centres and the diverse technology-based centres existing within each region (for example by establishing multidisciplinary groups and structures geared to problem-solving).

The aim should thus be to increase collaboration between industry, knowledge organisations and the public sector in the region. An efficient strategy to strengthen R&D activities in “traditional” sectors could be based on specific assistance to develop companies, clusters and sectors which invest more of their resources in R&D activities in the region, thereby allowing results to be maximised in the relatively near term.

Challenge 2: Stimulate entrepreneurship and innovation in SMEs

New firms and innovative SMEs are playing an increasing role as drivers of growth and job creation in the economy. However, West Sweden has a low number of new businesses (compared with the national average), and the region risks losing companies with growth potential if it cannot support their development.

To fulfil their potential for job creation and long-term growth, there is a need to develop the support system and ensures a business environment that stimulates entrepreneurship and innovation in SMEs. This can be done through the development of a set of structural policies addressing market, system and government failures in areas including financing, access to markets and knowledge networks, the management of intellectual assets and entrepreneurial human capital¹⁷. Example of such initiatives could be efforts to bring more risk capital to the region, and to support coaching and mentoring targeted at growing companies. Furthermore, Advisory services that focus on strategy development, skills acquisition, transfer of risk capital and networks and contacts is crucial.

Regional authorities should also promote and support access by companies, especially SMEs, to advanced business services and intermediate innovation centres that permit such firms to upgrade their production and increase their competitive advantages by means of innovation in diverse areas, such as marketing, design, organisational improvements, etc.

¹⁷ OECD (2010a)

Challenge 3: Upgrade traditional industry

Manufacturing industry has a significant presence in West Sweden compared to the country's other metropolitan areas, and Västra Götaland is a center of industry, trade and logistics. In recent decades there has been a rapid shift of employment from manufacturing to the service sector in West Sweden. This development is often portrayed as a sign of an ongoing de-industrialisation. At the same time, the manufacturing industry keeps playing a central role for the economy in West Sweden, and a central concern is how to restructure the industry to fit with the competitive reality of the global economy.

A key challenge is thus how to restructure the traditional industrial base to comply with the knowledge-intensive economy, and, as such, be able to compete effectively in the integrated European context and the global market.

While globalisation poses new challenges for regions and localities, it simultaneously creates new opportunities for them which arise from their unique capacity to serve as centres of learning and innovation. Future policy should therefore focus on improving the overall innovativeness of this sectors, for instance through economic restructuring and technological innovation.

2. Innovation Policy Governance

2.1 Institutional policy set-up and strategic actors

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 the elderly and child care) is administrated at the local, municipal level (kommun). During the last decade, responsibility for regional development has to an increasing extent been decentralised to the NUTS 3 regions (län), i.e. counties. Traditionally responsibility was shared between **County Administrative Boards** (länsstyrelsen), representing the national government at a regional level, and **Regional County Councils** (landsting). Over time, other types of directly or indirectly elected organisations for regional development have developed. Since 2007, Regional Development Councils have been developed in 14 NUTS 3 regions, including region Västra Götaland.

In 2007, the national strategy for competitiveness, entrepreneurship and employment 2007-2013 was presented by the Swedish 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. For designing and implementing the European Structural Funds 2007-2013, eight Swedish NUTS 2 regions were formalised. Today, all NUTS 3 regions are required to develop a RUP on a regular basis and all NUTS 2 regions have developed Operational Programmes for the ERDF. These programmes have been developed in regional partnerships with actors from different sectors, e.g. business, public sector, universities and non-profit organisations.

During recent years, innovation has become more important as the focus of Swedish regional policy has shifted from regional redistribution, to regional development and now to regional growth. During 2009, national agencies and business organisations initiated the process *Innovation for Growth*, to mobilise national and regional actors and provide input to the national innovation strategy¹⁸. In 2010, Sweden adopted a national services innovation strategy¹⁹ and in 2011 the government initiated a broad process to develop a national innovation strategy²⁰. During 2012, the Ministry of Enterprise, Energy and Communication presented the new national innovation strategy “The road to a world class innovation climate 2020”. The process of formulating the strategy was organised in broad dialogue with stakeholders in different parts of society, including regional bodies. There has also been a high degree of participation and involvement from all the Ministries of the Government Offices.²¹

National initiatives have been taken to encourage regional actors at the county level to develop regional innovation strategies²² and to create competitive platforms for competence development. Further, higher educational institutions have been encouraged to increase their collaboration with the surrounding society and to develop regional innovation offices. As a result, responsibility for innovation is to a large extent allocated to the regional level.

The national and regional public entities involved in the innovation system can be grouped in four categories. i.e. developing policies on national and regional level

¹⁸ IVA (2009)

¹⁹ Government offices of Sweden (2010b)

²⁰ Government offices of Sweden (2013)

²¹ Government offices of Sweden (2012)

²² Government offices of Sweden (2009)

(parliament, national and regional governments, ministries, local authorities and county councils), supporting implementation of policies and financing innovation and R&D (e.g. research funding institutes, **the agency for innovation systems - VINNOVA**, sectoral agencies), implementing research and development (e.g. universities and research institutes) or supporting commercialisation and entrepreneurship (e.g. **the agency for economic and regional growth - Tillväxtverket, ALMI, Innovation Bridge, incubators**). Many of these have regional representation.

The Region Västra Götaland is part of the larger national innovation system and the regional governance structure is a mixture of public and private initiatives, involving actors at different levels. To involve various actors, several clusters and cooperative platforms have been established. A Structural Funds programme has been developed for the region. Besides this, the governance structures of the NUTS 3 regions Västra Götaland and Halland are different and have not been integrated.

In Västra Götaland, the autonomy concerning regional innovation policies is high. **Region Västra Götaland (VGR)** is controlled by a politically elected regional council and has the overall responsibility for regional development. This includes health care, development and implementation of a regional development programme (RUP), including measures linked to lifelong learning, stimulation of research and innovation, infrastructure development, as well as implementation of the EU Structural Funds programme. Another important actor in Västra Götaland is **Business Region Gothenburg (BRG)**, a non-profit organisation representing 13 municipalities with the mission to contribute to regional development.

In Västra Götaland, the regional governance is well developed and dynamic, which facilitates research and technology development (RTD) cooperation between companies and institutions of higher education. There is also a clear ambition to integrate regional activities with national and EU policies and programmes. In 2010, the RTD and innovation strategy "Regional Policy for Global Impact - The RTD and Innovation Strategy of Region Västra Götaland", based on the regional development programme, was presented. The strategy is built on three pillars: RTD investments and clusters, entrepreneurship, and innovative SMEs.

Recently, Region Västra Götaland also adopted "Västra Götaland 2020 – strategy for growth and development in Västra Götaland 2014-2020" (VG2020), which was developed in broad collaboration in a region. Since 2011, a specific committee has developed the strategy in collaboration with municipalities and the regional body. The strategy sets out the framework for the Region Västra Götaland development and growth between 2014 and 2020²³.

²³ Västra Götaland 2020 (2013)

Table 1 Innovation policy governance

	Description	Comment
Degree of general regional autonomy	High	Region Västra Götaland (VGR) is controlled by a politically elected regional council and has the overall responsibility for regional development.
Degree of autonomy with regard to innovation policy	High/medium	Regional innovation policy is executed in alignment with the national strategy, but Region Västra Götaland develops the regional innovation strategy.
Set-up of regional governance system (centralised/de-centralised/fragmented)	Centralised with sub-regional coordination	Region Västra Götaland is the main coordination unit for innovation, but measures are also implemented and processed by sub-regional actors, open innovative platforms and incubators etc.
Nature of the process of strategy development (top-down/bottom-up/participatory)	Participatory	The innovation strategy is developed in broad collaboration through partnerships with regional actors.
Intra- and inter-regional co-operation	Medium/high	Region Västra Götaland was one of regions in Sweden with highest FP7 participation. Internationalisation and cooperation in innovation & research is highly prioritised by the region and a lot of resources are put into stimulating collaboration between regional actors and the international market. For example the region has an action programme for international research and innovation collaboration (Action programme or international research and innovation collaboration, 2013).

Table 2 Innovation Policy Institutional Set-Up and Available Human Resources

Policy stage	Primary organisation	Number of personnel directly in charge	Total number of employees	Summary assessment
Strategy development	Region Västra Götaland	11 + 20 (Research & Development unit, Business Development unit)	65 (Regional development secretariat)	The Research and development unit's mission is to develop strong research and innovation environments and the Business Development Unit's mission is to stimulate entrepreneurship, economic growth, innovation and improve the environment for business
Programming	Region Västra Götaland	11 (Research & Development unit)	65 (Regional development secretariat)	The unit for EU programmes acts as the secretariat for some of the programmes.
Implementation	Region Västra Götaland	65 (Regional development secretariat)	65 (Regional development secretariat)	All units have a regional development secretariat + association of local authorities
Monitoring and evaluation	Region Västra Götaland	7 (Analysis & evaluation unit)	65 (Regional development secretariat)	The unit's mission is to analyse trends, providing relevant facts and monitor and evaluate regional development.

2.2 A regional network of open innovation platforms

One important cornerstone of the innovation system is a regional network of open innovation platforms operated by sciences parks. The regional network of open innovation platforms is an important infrastructure to implement the innovation strategy. Many of the dynamic clusters in the region have developed with the help of these platforms, which also offer innovation support to SMEs, and stimulate international partnerships. A success-factor of the platforms is the partnerships of business, universities and public bodies setting joint agendas and collaborating on implementation. As stressed in Västra Götaland RTD & innovation strategy (2009), the open innovation platforms are important actors in implementing the innovation strategy.²⁴ The open platforms have developed into important infrastructure for research and innovation, and have a more dynamic role than traditional science parks.²⁵ Region Västra Götaland funds a number of these open innovation platforms and the intention is to bring together incubators, major research projects and company networks to stimulate ideas and innovative processes. Each of the science parks has two or three areas of strength, and most of them also have incubator activities.²⁶

The region has successfully created these platforms for interactive open innovation in prioritised areas during the last ten years, such as automotive/air transport, health/biomedicine, the maritime sector, creative industries, and smart textile. According to regional representatives, one crucial success factor is that partnerships of businesses, universities, institutes, and public authorities draft their strategy together and participate in implementation measures.²⁷ The OECD Territorial Review of Sweden has also acknowledged the model of interactive open innovation platforms as a best practice, stating that: "These platforms place Västra Götaland on the European research map as a region that is innovative, entrepreneurial and 'thinks outside the box'. Furthermore, these platforms have been efficient in improving innovation capabilities of SMEs and supporting them to be competitive on a global market. For example, Innovatum supported businesses and academia participation in the Joint Technology Initiative Clean Sky, and Lindholmen Science Park facilitates test and demonstration initiatives related to sustainable transport within PF7".²⁸

As outlined above, the region has several open innovation networks throughout the region, which is focusing on different fields of innovation.

- **Gothia Science Park** located in Skövde has an IT-profile with specific focus on computer games technology.
- **Innovatum Technology Park** in Trollhättan has its main strategic focus on production engineering, creative industry and audio-visual technology; and energy technology and environmental engineering.

Three of the open innovation platforms are located in Göteborg:

- **Lindholmen Science Park** is an international Science Park specialised in three areas: intelligent vehicles and transport systems; information and communication technology; and modern media and design.
- **Johanneberg Science Park** primarily focuses on the fields of urban development, energy, and material & nanotechnology.

²⁴ Region Västra Götaland RTD (2009)

²⁵ Public Service Review (2010)

²⁶ Region Västra Götaland (2013)

²⁷ Public Service Review (2010)

²⁸ OECD Territorial reviews (2010)

- **Sahlgrenska Science Park** focuses on pharmaceutical, medical technology, medicine, and society.

2.3 Innovation support actors

Important actors in the regional innovation system are the four sub-regional bodies, which should support the implementation of the VG2020 and innovation measures. Each sub-region has a specific organisation that works to promote local business development:

- **Business Region Göteborg** has the main responsibility for business development in the Gothenburg Region and works to strengthen and develop trade and industry in the Gothenburg region.
- **Industrial Development Sweden** is working in Skaraborg with coordinating efforts to stimulate industrial development and innovation;
- **IUC Sjuhärad operates** in Sjuhärad Region and is supporting small and medium sized companies in terms of business development;
- **The adaptation office - Fyrbodalen** (Omställningskontoret) has the responsibility to promote regional growth, employment and support local businesses in Fyrbodalen region.

In addition to the local development offices there are also incubators and other forms of business support organisations which provide support in innovation and business development.

The region conducts a number of activities aimed at influencing and changing attitudes to entrepreneurship and innovation. There are a number of activities that target the education system by influencing attitudes and knowledge-building work. One example is “Ung Företagsamhet” (Young Enterprise), a non-profit organisation which operates in all Västra Götaland sub regions. Young Enterprise gives young people the opportunity to try to start and run a business during high school. Västra Götaland runs several projects related to changing attitudes towards entrepreneurship. One example is “Ungt Entreprenörskap i Skolan” (Young Entrepreneurship in school), whose purpose is to influence attitudes towards entrepreneurship in schools. The project brings together different actors involved in entrepreneurship in schools to facilitate the exchange of experiences and concrete measures to boost entrepreneurship among youth.

The region has a number of actors that provide support to shape and develop innovative and entrepreneurial ideas and provide support in the establishment of new companies based on entrepreneurial and innovative ideas. Innovation Västra Götaland is a project run by Almi Corporate Partners with support from Region Västra Götaland. Its mission is to help new ideas develop into commercial products by providing expertise and capital. Most of the region's colleges and universities participate in the Drivhus foundation, which is an attempt to increase the entrepreneurial thinking and getting students to develop their ideas. The program is funded partly by public funds, partly by partnerships with industry.

Västra Götaland also funds academic entrepreneurial education in order to educate future entrepreneurs and assist in the commercialisation of new knowledge. In collaboration between university and industry the aim is to develop promising ideas or research results into new businesses. The program is offered at Chalmers University of Technology, Gothenburg International Bioscience Business School, University of Gothenburg, and University of Skövde.

Incubators are contributing to the development of start-ups. Through the incubators, selected entrepreneurs and business projects are given the opportunity to be part of an environment where they are supported by experienced business developers who create a stable platform for developing the idea into a business. Incubators usually offer support and networking for all issues important to the company and thereby aims to

be a tool for creating growth. Most of the incubators in the region are related to a college or university. The region's incubators are:

- **Brewhouse Innovation** - a creative centre for companies in the music, film and media sectors;
- **Chalmers Innovation** - supports existing industries, innovators from industry, or students or researchers from higher education;
- **Framtidens Företag** - offers newly established companies in all sectors office space in a work environment with other entrepreneurs;
- **Katapult of Sweden** - offers support for entrepreneurs, investors and spin-off companies;
- **Sahlgrenska Science Park in Gothenburg** - offers researchers and innovators with good ideas free evaluation and helps with development and funding of business concepts in the life science field, i.e. biological and medical areas.

In addition, the not-for-profit incubator IQUBE, which is situated in Gothenburg, provides early-stage growth companies with strategic business processes. Other incubators are Gothia Science Park in Skövde, Innovatum in Trollhättan and Espira in Borås.

Several of the incubators in Västra Götaland are members of the West Swedish network “Inkubatorkompetens” (Incubator Competence). Its goal is to increase the survivability and growth rate of the companies in the incubator. This is achieved among other things by strengthening cooperation and enabling exchanges of experience between the incubators in the network. Inkubatorkompetens also provides funding for strategic competence development projects.

NyföretagarCentrum (centre for startups) which is part of the national organisation Jobs and Society, is focused on providing general support for the establishment of new businesses. It does not have a specific sectorial focus or requirements for connection to the academia. Such centres are present in Borås, Göteborg, Götene, Skövde, Hjo, Härryda, Kungsbacka, Kungälv, Lidköping, Tibro/Hjo, Trollhättan, Vara och Vänersborg. The centres work with a number of activities such as counseling, guidance, idea assessment, seminars and lectures for entrepreneurs in the startup phase. There are also a number of inventors’ associations which act as a forum for exchange of ideas and interaction between inventors, research and business. Such associations are present in Gothenburg, Bohus-Dal, Karlsborg, Hjo-Tibro and in the form of Prototype Workshop / Active Innovators in Mölndal. Almi IFS West is working to facilitate entrepreneurship among immigrants through advisory activities for entrepreneurs with foreign backgrounds. Winnet Västra Götaland, which is a resource center for equal growth and development, is, among other things, supporting women’s entrepreneurship.

Connect West helps entrepreneurs in the growth phase with issues such as strategy development, skills acquisition, transfer of risk capital and networks and contacts. In the region there are also other actors that provide support, for instance on export-related issues. The Trade Council in Gothenburg, which is funded by the government and business jointly, advice companies on export issues. It serves companies in all industries. It provides free information on all aspects of markets and exports. West Swedish Industry and Commerce is a business organisation that works to strengthen growth in the region. The organisation helps member companies in matters related to import, export or the domestic market. Innovation Västra Götaland, which involves collaboration between Almi West AB and Region Västra Götaland (VGR), provides funding for new projects in an early stage. In addition companies can get seed money from Innovationsbron (“Innovation Bridge”), which is linked to the region's incubators and universities’ holding company. The Innovation Bridge also provides verification and intellectual property protection of research with commercial potential.

Support for innovation in existing companies is crucial. Industrial Dynamics (ID) is a network made up of 15 member organisations, all with expertise in various industrial fields, who provide innovation support to SMEs in Västra Götaland. The aim is to strengthen innovation, growth and competitiveness of existing businesses. The ID Network includes various industrial research institutes and industrial development centres in Västra Götaland and university colleges in Skaraborg, Fyrbodalen and Sjuhärads. ID is also an important part of the open innovation platforms.

A number of research institutes are involved in supporting innovation and skills development in various sectors. Examples of such institutes are SP Technical Research, SIK - the Swedish Institute for Food and Biotechnology, Imego AB - The Institute for Micro and Nanotechnology, IVF Industrial Research and Development Corporation, and IVL Swedish Environmental Research Institute.

The region has a number of centres aimed at supporting industrial development. Examples of such organisations, which operate at the sub-regional level, are IUC Sjuhärads and IDC West Sweden AB. They are owned by member companies and the task is to facilitate contact and knowledge between small and large companies in the region, and universities. The aim is also to contribute to the development of industry clusters within sub-regions.

Several regional actors are actively seeking to improve the conditions and stimulate clusters in the region by strengthening the links between business and research and by fostering synergies between regional clusters. What is distinctive with regards to investment in cluster development in the region is that companies, research and public actors jointly discern and prioritise actions. Examples of such cluster initiatives are Biomedical Development in Western Sweden and Biomatcell, which target biomedicine and health; Smart Textiles which targets the textile industry; centre of excellence Plastic for a Sustainable Society (PLUS) which targets the plastics and petrochemical industry; Chalmers Lighthouse which targets the shipping industry; Microwave Road which targets the microwave industry; Kitchen Empire; and last, the general cluster initiative Centre for Environmentally Driven Enterprise.

2.4 Key challenges and opportunities

The regional governance system is well developed and Region Västra Götaland is the main responsible body for facilitating innovation and development. However, the drafting of regional strategies is conducted in a participatory manner, including a range of actors throughout the region. The four associations of local authorities are essential for coordination with municipal authorities and for implementation at the local level. Beside main public actors, the network of open innovative platforms is key for implementing regional innovation strategies. It has been proven that these are efficient with regards to improving capabilities of SMEs and for stimulating innovation development.

The regional development secretariat in Region Västra Götaland is a well-established institution and has sufficient human resources for innovation measures, including personnel in strategy-making and programming, and an analytical unit for evaluations and monitoring.

Even if the institutional set-up is well developed, there are always remaining challenges in coordinating innovation measures and strategies in the region. The recently adopted VG2020²⁹ that will be implemented 2014-2020 is highly dependent on active coordination between the public administrative body Region Västra Götaland (VGR), the local authorities, open innovation platforms, universities, businesses and organisations. An active engagement among these actors is a prerequisite for handling the challenges in relation to the innovation system.

²⁹ Region Västra Götaland (2013c)

3. Innovation Policy Instruments and Orientations

3.1 The Regional Innovation Policy Mix

At the NUTS 2 level there is no common regional innovation strategy for West Sweden. However, at the sub-regional level public support for innovation and entrepreneurship is treated addressed in the Growth Programme for Västra Götaland 2008-2013 (Tillväxtprogram för Västra Götaland). The region has already launched a new strategy for growth and development that will be implemented from 2014: Västra Götaland 2014-2020 (VG2020).

Several projects and processes have taken place with an ambition to develop a better understanding of regional innovation capacity. The regional policy is executed in alignment with national policies and in smart synergy with the European policies and funding instruments for cohesion, research and innovation. The regional innovation and growth strategy supports business innovation, innovations systems, R&D programmes and excellence centres, start-up companies (seed funding, VC), communications infrastructure and cultural institutions.

In addition to the regional growth programme there are four sub-regional growth programmes for Fyrbodalen, Göteborg, Skaraborg, and Sjuhärad. The local authorities are responsible for coordinating the implementation of the sub-regional growth programme, in collaboration with stakeholders, to initiate, implement and participate in funding of programmes and activities in development priority areas. The regional growth programme also includes an RTD and innovation strategy which resides on three pillars: Entrepreneurship, Innovative SMEs, RTD investments and clusters. It combines relevance and excellence, targeting key industrial innovation and research areas in the region such as: Automotive/Air Transport, Health/ Biomedicine, Energy, Maritime Sector, Creative Industries and New Materials.

The Growth Programme for Västra Götaland that was implemented from 2008-2013 focuses on regional conditions to achieve better coordination and collaboration between stakeholders working on issues that support long-term business development. The programme is a tool to prioritise and coordinate resources at the regional and sub-regional level. These resources are available from a variety of stakeholders such as municipalities and regions, universities, research institutes, other governmental authorities in EU programmes, etc. The programme specifically focuses on the following three areas; promoting innovation, safeguarding human resources, and developing infrastructure.

The growth programme sets regional priorities to support a strong long-term business development and is a tool to prioritise and coordinate system-enhancing resources in these areas. The programme does not contain detailed objectives and examples of activities; these are found both in EU programmes in the region and in other implementing tools. Based on the principles for implementation of the programme every actor decides on the goals, strategies and actions for the activities in which they are responsible. Different stakeholders participate according to their goals through their own activities and in collaboration with others. To facilitate implementation of the programme, municipalities, businesses, organisations, social partners, universities, research institutes, government agencies, local and regional companies and other stakeholders are supported by a programme committee that consists of key stakeholders related to the programme's growth targets. Their task is to facilitate the work of coordinating regional development in accordance with the programme's focus. The programme committee also contributes to the annual follow-up of the growth programme.

The Growth Programme is funded by the participating stakeholders and with the support of development resources allocated for various purposes related to the programme areas. Decisions on funding under the Regional Growth Programme

(including sub-regional programmes) are provided for use by regional development resources in other programmes such as the EU Structural funds and will precede decisions on these. The EU programmes affecting the region contains detailed descriptions of objectives and activities that will be part of the implementation of the growth programme.

The new Strategy for Growth and Development in Västra Götaland (VG2020) that will be implemented for the period 2014-2020 was recently launched. While the strategy has a broader focus on regional growth and development, it also includes support measures that targets areas such as research, innovation and human resources that contribute to the development of the regional innovation system. VG2020 sets the framework for the work on growth and development between 2014 and 2020 and is the main tool to implement the common vision of the region concerning “the good life”. The strategy is developed in line with the Swedish development policy and addresses challenges and goals of the EU 2020. It covers sustainable development based on three dimensions - economic, social and ecological.

The strategy has been developed through broad cooperation in Västra Götaland. The work has been led by the Minister of Sustainable Development, where elected representatives of the municipalities and Region Västra Götaland together drive strategic development. A large number of actors and individuals from all parts of society have contributed actively in shaping the strategy. The program strategy covers both the regional level (Västra Götaland) and sub-regional level (Fyrbodalen, Gothenburg region, Sjuhärads and Skaraborg). A significant part of the region's innovation support work is related to actors who are active in the four sub-regions. The financing is done through the various organisations' normal own resources, and through special project funding. An important part of the special project funds are the regional development resources, which are specifically aimed at cluster development, innovation and entrepreneurship.

The strategy raises the following three conditions for favourable development;

1. a common development policy which is based on the region's "strong clusters";
2. good conditions for internationalisation; and
3. the need for environmentally driven development and its benefits to the international competitiveness of business in the future.

Regarding the first condition, it is stated in the strategy that the region should continue its work on creating a coordinated and powerful West Swedish innovation system, focusing on the region's many strong clusters. Västra Götaland in particular has the ambition to be a world leader in five identified strength areas, i.e. life science, sustainable transport, sustainable urban development, green chemistry, and marine environment / marine sectors. Other strong areas in which active development is to be prioritised are textile/fashion/design, materials (Nano, plastic, wood) and sustainable production, cultural and creative industries, renewable energy, food/green industries, information and communication technology (ICT) and tourism. These strengths and priorities are part of Västra Götaland's efforts of so-called smart specialisation. The work is to be conducted so that new clusters and new businesses can develop from existing specialisations. In doing so, the dependence on individual sectors and companies is reduced.

A main target is that knowledge and skills from various industrial clusters meet and interact with academia and society in general. The program emphasises that the innovation system must be of high quality in terms of knowledge, skills, capital and contacts. The approach advocated is through extensive development effort to develop new innovative growth through incubators, project arenas and corporate networks, and continued expansion of strong platforms for development between companies, universities and policy in all parts of the region.

Examples of support measures to strengthen the priority areas (table 3) are;

- InMotion
- Göteborg BIO
- Smart Textiles³⁰
- The Scandinavian 8 Million City
- Research and development in SMEs - R&D checks

Västra Götaland aims at being one of Europe's leading regions in environment, energy and next generation sustainable transportation, and the Automotive/Air Transport industry is a target area for the region. As a consequence of the economic crisis and in order to stimulate adaptation and innovation in automotive industries, Region Västra Götaland decided to implement the InMotion programme in 2008. InMotion is focusing on promoting sustainable transformation and development for transport solutions and energy systems. It focuses on the development of electrification and decreasing the dependence on fossil fuel sources. Funding is provided to projects and initiatives within the following six areas: environments for knowledge development, testing and demonstration; development projects (products, services, processes); internationalisation; market influencing actions - development and implementation methods for innovation procurement; SME funding; and strengthening of collaboration platforms, Lindholmen Science Park in Gothenburg, and Innovatum in Trollhättan. All projects supported by the InMotion programme are based on a Triple Helix model, including collaboration between academia, industry and the public sector. The initial project funding of €15m has increased to almost €60m through other regional, national and EU-funding.

Another target area is Health/Biomedicine. The Göteborg BIO programme - Biomedical Development in Western Sweden - runs from 2004 to 2014 and aims at strengthening and developing the basis of long-term growth within the biomedical field. This is done through the development of tools, platforms and processes to develop research into innovations and applications through activities in four operational areas. The first of these deals with strengthening the commercial returns on research and development by funding and compiling R&D projects within biomedicine and the profile areas of biomaterials and cell therapy. The second area deals with educating and training future leaders in business development within the biomedical area, e.g. the International Bioscience Business School (GIBBS) at Chalmers School of Entrepreneurship. The third area focuses on strengthening and developing the infrastructure of commercialisation within the biomedical area. Within the fourth area, the initiative is working to attract advanced competence and capital to the biomedical area in the region. The initiative is partly financed and supported by the Swedish Governmental Agency for Innovation Systems (VINNOVA) programme on regional innovation, Vinnväxt, and Göteborg BIO is one of the few regions that will receive up to SEK10m (€1.1m) per year from VINNOVA.

The overarching objective of The Scandinavian 8 Million City is to promote sustainable economic growth by reducing travel time, create new arenas for business cooperation, stimulate closer academic cooperation and strengthen the marketing of the region as an attractive location. With this motivation, the project takes a strategic approach and will, by illustrating the benefits of a world class green and multimodal transport system, secure that the national authorities in Denmark, Sweden and Norway reach a common decision regarding investments in Inter City and High Speed Rail. The partners are the majority of the local and regional authorities as well as three government agencies in the corridor between Oslo, Gothenburg and Copenhagen, and this is an extended continuation of the partnership in a precedent project, hence the name COINCO (Corridor of innovation and cooperation) North II. The Scandinavian 8 million City is co-funded by the EU. The project was approved for funding through the

³⁰ Chapter 3.3. gives a detailed overview of Smart Textiles

Interreg IV AÖresund-Kattegat-Skagerak programme in December 2011, and will be running until autumn 2014.

Research and development in SMEs - R&D checks intends to strengthen the SMEs possibilities to: Compete in global markets; Contribute to sustainable growth and create new employments; and Contribute to a more energy efficient production and consumption. The support is primarily addressed to projects and development action in order to strengthen the companies' international competitiveness and to contribute to energy efficiency. In the programme is it possible for companies to apply for so called R&D checks: R&D check (Base) - maximum of 50 000 s.kr for investigation of what R&D actions that is needed for the company to develop new knowledge; and R&D checks (Advanced) - maximum 500 000 s.kr for research projects which intends to help the company to reach new scientific knowledge and competence in order to develop new services, products and processes. In both cases the programme co-finances, operated by the Region Västra Götaland, and covers the costs for work done by the research institute, universities or other organisations. The companies must invest the equal amount, either on cash or in working time.

Regarding the second condition, which targets the global industry in Västra Götaland, the strategy mentions that attractiveness for students, researchers, scientific staff etc., is important in order to continue to be a leading industrial region as well as keep its place as one of the top regions in the world with regards to company investment in R&D. The R&D intensive companies are a vital factor for attracting students, researchers and qualified employees.

Geographically, the major challenge is to recognise and exploit Gothenburg's role as an engine for growth, development and attractiveness of West Sweden as a whole, while strengthening the development prospects in the region. Content and priorities in the stagey strategy has thus deliberately been formulated to achieve this, and the strategy has a clear urban focus, although it also includes continued efforts to develop other regional centres/nodes, mainly in the Trestad, Borås and Skövde. The implementation needs of regional and sub-regional institutions to take greater responsibility for facilitating cooperation with their environment.

The strategy also contains also a large number of priorities that are aimed at directly strengthening each municipality in Västra Götaland. These priorities focus on promoting entrepreneurship, business, culture, participation, training, validation, education and employment, etc. Special efforts are also made in terms of increasing trade with neighbouring regions and contain a clear prioritisation of increased cooperation with Norway and Öresund is stressed. Tearing mental and legal border barriers and develop collaboration and cooperation with Norway is a key issue for the future.

Regarding the third and last condition, which targets environmentally driven development, it is emphasised that Västra Götaland takes responsibility for global sustainable development. This implies that procurement is managed in a responsible and resource efficient manner. Furthermore, the region has decided to set the target the energy supply should be without fossil fuels by 2030.

The Regional Plan for Social Funds and a Regional Structural Funds Programme that both run from 2007 through 2013 and cover both Västra Götaland and Halland. The Regional Plan for Social Funds targets efforts to promote skills development, labour supply and reducing exclusion, which are central to the development of West Sweden. Although the region has seen a positive development, structural problems in the labour market in the long term must be solved in order to strengthen regional competitiveness. The challenge is to contribute to a knowledge-driven business environment, raising skills levels in the labour market and to facilitate labour market entry for all population groups. Furthermore, urban development and sustainable urban development's social dimension has a strategic importance for increased regional competitiveness and employment in West Sweden. This is particularly

relevant for Gothenburg, Trollhättan, Borås and Halmstad. Vulnerable neighbourhoods in these cities are of particular concern within the program area.

Other areas of focus are measures to counter discrimination and promote equality as well as activities that improve the individual's ability to enter the labour market. A portion of the work force has, for various reasons, ended up being excluded from the labor market, a situation that could be permanent. This group mainly includes those who have skills that are no longer needed, those that have an incomplete education, people with foreign backgrounds, the disabled and sick. There are also structures, norms and attitudes in society that hinder movement even for those who have a job. The structure of the West Swedish labour market could cause problems for the status of women as women tend to have lower incomes, a greater proportion of women are involved in part-time work, etc.

The Structural Funds Programme for Regional Competitiveness and Employment specifically targets regional competitiveness and employment from a business perspective. The overall purpose of the implementation of Structural Funds programs is to enable joint national and regional priorities between areas of regional policy, labour market policy and the EU cohesion policy. Overall the Regional Structural Funds Programme focuses on measures to promote sustainable growth, competitiveness and employment. In the 2007–13 programming period, Sweden focuses its cohesion investment on four thematic strategic priorities in support of the Lisbon objectives for growth and jobs: Innovative environments and entrepreneurship; Skills supply and increased labour supply; Accessibility; and Strategic cross-border co-operation. The overall goal of the Swedish national structural fund strategy is “growth through relevant skills and an increased labour supply”. This strategy gives the guiding principles for the development of regional strategies. Sweden's national growth depends on the growth created locally and regionally, and sustainable economic growth requires that human resources are utilised and that the interaction takes place between people, companies, municipalities and government. Target areas in the 2008-2013 programme have been R&D in SMEs, social entrepreneurship, sustainable business development, industrial dynamics, and innovation management and advisory services in the target areas.

Table 3 Existing regional innovation support measures

Title	Duration	Policy priorities	Budget	Organisation responsible	More information
InMotion	2009-2013	<ul style="list-style-type: none"> • 2.2.3. R&D cooperation • 4.1.1. Support to sectoral innovation in manufacturing • 4.1.2. Support to innovation in services 	€60m	Region Västra Götaland	InMotion
Göteborg BIO - Biomedical Development in Western Sweden	2004-2014	<ul style="list-style-type: none"> • 1.3.1. Cluster framework policies • 2.2.2. Knowledge transfer • 2.2.3. R&D cooperation • 3.3.2. Recruitment of skilled personnel in enterprises 	€2m per year	Region Västra Götaland	Göteborg BIO - Biomedical Development in Western Sweden
Smart Textiles	2008-2017	<ul style="list-style-type: none"> • 2.2.3. R&D cooperation • 2.2.2. Knowledge transfer • 4.1.1. Support to sectoral innovation in manufacturing 	€11,5m	Region Västra Götaland	Smart Textiles
The Scandinavian 8 Million City – Corridor of Innovation and Cooperation (COINCO)	2011-2014	<ul style="list-style-type: none"> • 1.2.2. Innovation strategies • 2.2.2. Knowledge transfer • 2.2.3. R&D cooperation 	€200 000	Business Region Göteborg	COINCO
Research and development in SMEs - R&D checks	2010-2013	<ul style="list-style-type: none"> • 2.3.1 Direct support of business R&D (grants and loans) 	€1m	Region Västra Götaland	Research and development in SMEs - R&D checks

Title	Duration	Policy priorities	Budget	Organisation responsible	More information
		<ul style="list-style-type: none"> • 4.3.2. Support risk capital • 4.1.2. Support to innovation in services 			

Source: RIM Plus repository Västsverige

3.2 Appraisal of Regional Innovation Policies

In the Structural Funds Programme it is highlighted that the West Swedish economy is highly internationalised and thus exposed to a growing global competition. The most effective way to respond to globalisation is to increase innovation and to take advantage of innovative ideas that may lead to new businesses.

Regional innovation policy has to a large extent targeted business development through support measures such as InMotion or structural funds programmes targeted at increased collaboration between regional actors and entrepreneurship. InMotion has an explicit aim to be based primarily on the strategic collaborations that already existed in Västra Götaland and promote increased collaboration between industry, knowledge organisations and the public sector. Examples of activities undertaken within the framework of projects financed by InMotion include the establishment of new venues, common business intelligence and application of new tools and procedures. These activities have already been useful for several of the participants. Perhaps the most important result in the short term has been the establishment of new contacts with companies and other stakeholders; despite geographical proximity, there seemed to be little collaboration between actors in the region. As such, InMotion has been successful in establishing cross-sectoral collaboration, for instance between the automotive industry and the energy sector, and industry and public bodies.

Several successful sustainable transport initiatives were created with the help of InMotion resources, such as for example the Active Safety and Test Arena (ASTA) outside Borås. Region Västra Götaland launched four similar programmes in specific areas of strength during the autumn of 2012. The region is also member of the EU platform for Smart Specialisation Strategies in Seville and is participating in the OECD TIP-project on Smart Specialisation. In an evaluation of the programme³¹, it is emphasised that the projects carried out within the framework of InMotion have contributed to new contacts and increased collaboration across industries and sectors. However, the evaluation shows that it is primarily larger companies and public bodies that have been active, especially in the early stages of projects. Although small and medium-sized enterprises have been a stated target audience for the programme, in many cases it has been difficult for them to participate.

Generally, regional action programmes like InMotion are an important addition to national and EU funded programmes in that they strengthen regional development and research efforts. In the evaluation of InMotion it was emphasised that regional funding has an important role as a complement to national and European funding since the regional efforts are often perceived as more applied and better adapted to the local and regional needs. Furthermore, regional initiatives have significant value because they contribute to the development projects and processes that have a clearer regional acceptance and legitimacy. Last, such programmes help Västra Götaland VGR position itself against other regions, which is particularly important in a global perspective because Västra Götaland to a large extent competes with international regions that attract investment, business and human capital.

Over the last five years, the collaboration on innovation between the counties of Fyrbodal, Göteborg, Skaraborg, and Sjuhärad has increased, as a result of the joint Operational Programmes for the European structural funds (ERDF and ESF) in West Sweden, and there are clear examples of the long-term positive effect of initiatives. The West Swedish programme has had a conscious commitment to structural programmes that largely rests on the priorities of the regional programmes in Västra Götaland and Halland. The programme aims at stimulating entrepreneurship and especially start-ups, which is in light of the low number of new businesses in West Sweden compared with the national average. Efforts to improve the support structure are also central,

³¹ Region Västra Götaland (2011a)

and initiatives especially focus on advisory services for entrepreneurs and access to seed capital. Another important area is development of existing businesses, with a focus on increased collaboration and a strengthening of the support system through investments in incubators.

Efforts to improve the innovation and commercialisation have been dominated by a number of large and strategic projects aimed at increasing innovation capacity in the region. These efforts are well placed to create structural change by establishing new and permanent structures that can stimulate innovation. Many of the investments that have been made in this area have formed new structures. One example is investments in health technology in Halland, which have resulted in new health technology centers. Examples from Västra Götaland are ASTA and Innovatum in Trollhättan, which demonstrate how to build a permanent structure with the help of structural funds that helps strengthen the innovation culture in the region.

Despite the strong focus in the programme on entrepreneurship and the importance of changing attitudes towards entrepreneurship there are relatively few efforts undertaken in this area. Rather, there is a focus on support measures for existing companies, where the intention is to facilitate business growth. Examples of such initiatives are InMotion Göteborg BIO and Smart Textiles. In addition, projects are intended to increase the capacity for innovation in existing businesses and in industries where West Sweden has strengths, such as in automotive, life science and textile. There are also several initiatives which aim to increase collaboration between industries or between industry, academia and public authorities, for instance Research and development in SMEs - R&D checks. However, few initiatives are intended to implement changes by using horizontal criteria.

Regarding synergies between the national and regional innovation support measures, the Growth Programme for Västra Götaland 2008-2013 is closely related to the national strategy for competitiveness, entrepreneurship and employment, which is a guideline for the Regional Development Programmes (RUP) and the regional structural funds programmes (ERDF and ESF). The program is intended to contribute to national and international goals for human, economic and environmental development. Furthermore,

The national measures with higher relevance for the region are the ones that aim at improve conditions for attracting international investments and peak competence for research and development in the public and private sectors. Access to skilled labour is important if West Sweden want to retain its position as an innovation leader in Europe. Good general framework conditions for businesses and entrepreneurship on the national level is also crucial for the innovation climate and in order for West Sweden to be an attractive prospect for investments, businesses and individuals.

3.3 Good practice case

Smart Textiles (table 3) is a prioritised research area in the region and a regional initiative in Region Västra Götaland (Sjuhärad – Borås). Smart Textiles gathers researchers and technicians within textile and fashion design, nano-fibre technology, interaction design, tricot and weaving technique and manufacturing techniques. The objective is to facilitate a dynamic innovation system, to promote growth and create new job opportunities in West Sweden.³² Smart Textiles support various activities in order to trigger innovation, such as:

- stimulation of triple-helix co-operation;
- commercialisation of products; and
- internationalisation processes.

³² Region Västra Götaland RDT (2009)

The initiative involves companies, universities and organisations connected to the textile industry in West Sweden. The initiative is driven by local actors such as university of Borås, TEKO, Swedish Textile and Clothing Industries' Association, Sjuhärad Association of Local Authorities, Swerea IVF, ESPIRA Growth Centre in Sjuhärad and Interactive institute. Smart Textiles is also a regionally prioritised development initiative, partly financed and supported by the Swedish Governmental Agency for Innovation Systems (VINNOVA) within the programme on regional innovation systems, VINNVÄXT. Furthermore, it is supported by industry and co-financed by EU structural funds.

The textiles industry has a strong tradition in Sjuhärad – Borås and the industry has to a large extent shaped the identity of the area. More or less half of the textiles industry in Sweden is geographically located around Borås and hosts important logistical hubs related to the industry. During the latest decade the regional industry has experienced major structural changes and challenges for reshaping the textile industry. In this context, Smart Textiles has helped accelerate the process and to form a dynamic innovation system. Furthermore, it has helped establish an internationally leading position with regards to design, development and production of next-generation textile products. As concluded in VINNOVAS mid-term evaluation, the initiative has stimulated further collaboration within the innovation system, new start-ups and to internationalisation of textiles industry. One concrete example of how Smart Textiles contributed to creation of new businesses is the start-up firm Initio AB. By support from Smart Textiles, a textile designer and engineer founded the firm and during 2010 the first products were launched on the market. Smart Textiles also co-funds a project for students conducting an analysis on market development of the sporting apparel market in collaboration with the industry.³³

An international evaluation from VINNOVA also states that the regional and national support gave the textiles industry an opportunity for upgrading.³⁴ It underlines that the upgrading includes improvements in competence within firms as well as within inter-firm networks or clusters. The evaluation indicates that the program has facilitated the development from mass production of standardised goods to a more flexible production system centred on high value added, technology intensive goods.³⁵

Another development is that Smart Textiles has become an important initiative in FP7-project CROSSTEXNET. Smart Textiles has in that sense been an important foundation for working with other textiles regions and for developing international networks and businesses. As indicated by regional representatives, the work with Smart Textiles has generated an opportunity for the region to be a lead partner in CROSSTEXNET. It demonstrates that local mobilisation, regional and national support schemes can contribute to a upgrading of a local industry to an international leading industry. The collaborative efforts between the local, regional and national level are important for developing regional innovation systems and to facilitate internationalisation of local industries.

3.4 Towards Smart Specialisation Policies

In the OECD territorial review from 2010³⁶, it was emphasised that Västra Götaland is one of the regions in Sweden where regional development efforts have been successful. The report not only refers to the handling of the crisis in 2008/2009 but also the collective efforts on innovation and entrepreneurship. However, one important recommendation is to encourage further development towards stronger regions, and one way to develop stronger more competitive regions is through smart specialisation.

³³ VINNOVA (2008)

³⁴ VINNONVA (2011)

³⁵ VINNOVA (2011)

³⁶ OECD (2010b)

The concept of smart specialisation or RIS3 (Research and Innovation strategies for Smart Specialisation) is a new emerging policy orientation designed to promote the efficient and effective use of public investment in research³⁷. Its goal is to boost regional innovation in order to achieve economic growth and prosperity, by enabling regions to focus on their strengths. Smart specialisation is a dynamic strategic process where regions identify their long-term competitive advantages based on local strengths, and define those actions that can lead them to maintain and/or create their competitive position. The main idea is that spreading investment too thinly across several fields risk limiting the impact in any one area.

The concept of smart specialisation is also mentioned in the VG2020 strategy, where it is stated that Västra Götaland has the ambition to be a world leader in their areas of strength. However, the versatility of the industries that operate in the region requires a development with relatively wide priorities. The work with smart specialization is therefore deliberately carried out in a way that allows knowledge and skills from different industrial clusters to meet and interact with academia and society in general.

The RIS3 is rooted in the growth programme, and the smart specialisation strategy is implemented through the creation of innovative environments (collaboration platforms, incubators, centres of excellence), competence programmes (e.g. InMotion), and support for projects and collaborations. The budget for implementation in 2012 is SEK 305m (€34.2m).

Västra Götaland has defined the following five priority areas³⁸: Bio medicine and health (Life science); Smart textiles; Environment, energy and sustainable transportation; Maritime industries, support to maritime industries and sustainable transportation by sea; and Sustainable cities (table 4). Behind these clusters we find a supporting infrastructure of centres of excellence, innovation platforms, cross-disciplinary networks, etc. Many of these are recognised as European Centres of Excellence, such as Lindholmen Science Park in the areas of active safety, and biomaterials through the joint project BIOMATCELL. The priority areas were chosen based on a process where politicians, academia and industry were involved. In all these areas the region is or has ambitions to be a world leader. Other strong areas in which active development is to be continued are textile/fashion/design, materials (Nano, plastic, wood) and sustainable production, cultural and creative industries, renewable energy, food/green industries, information and communication technology (ICT) and tourism. The work will be led in a way to allow new clusters and new businesses to develop from existing specializations. This way, dependence on individual sectors and companies will be reduced.

Participation in CROSSTEXNET³⁹ is an example of how Region Västra Götaland manages to tie its key business sectors and areas of expertise to EU programmes and smart partnerships. CROSSTEXNET is a collaboration programme between 17 different European regions and countries where Västra Götaland has a leading role. The goal of the programme is to coordinate participants' various research programs on technical textiles, also called smart textiles, and fibre-based materials, thus making available more efficient and smarter funding of research projects for industry. The aim is to strengthen the textile industry by leveraging innovation and market potential of international cooperation and to reduce fragmentation and overlap of the European textile research.

As important input to the smart specialisation strategy, the region regularly evaluates and monitors the development. For instance, the Vision Västra Götaland and other policy documents are updated on a regular basis, there is a regional report every five

³⁷ European Commission (2013)

³⁸ European Commission (2013)

³⁹ European Commission (2010)

years (follow-up sustainable development and identification of challenges), and the Västra Götaland region is continuously compared with the European regions in terms of development and competitiveness. The region also performs evaluations on clusters and science parks, they follow the development of industries with quantitative indicators, and they perform evaluation of the specific area of strength programmes. One example of such an evaluation is the evaluation of InMotion⁴⁰, one of the regional innovation support measures which targets the automotive and transport industries. The purpose of the evaluation was to increase knowledge for the future development of initiatives for strengthening the regional competitiveness.

The main critique against cluster policies is the risk of path dependence and lock-in effects due to support of existing industry structures. However, in West Sweden the traditional cluster policy framework has been developed to support not only the dominating industry sectors, but to broaden the industry base for innovation. By stimulating cross sector collaboration and the development of new sectors, a potential is provided for smart specialisation by developing specific niches in the intersection between established and new sectors.

Table 4 Smart specialisation priority areas Västra Götaland⁴¹

Description	Capabilities	Target Markets	EU Priorities
Bio medicine and health (Life science)	1. Research and development within manufacturing and industry 2. Basic pharmaceutical products and pharmaceutical preparations	1. Manufacturing and industry 2. Basic pharmaceutical products and pharmaceutical preparations	1. Public health and security
Smart textiles	1. Research and development within manufacturing and industry 2. Textiles, wearing apparel and leather and related products	1. Manufacturing and industry 2. Textiles, wearing apparel and leather and related products	
Environment, energy and sustainable transportation	1. Energy production and distribution	1. Transporting and storage	1. Sustainable innovation
Maritime industries, support to maritime industries and sustainable transportation by sea.	1. Research and development within manufacturing and industry 2. Motor vehicles and other transport equipment	1. Transporting and storage 2. Water transport and related services	1. Sustainable innovation 2. Smart green and integrated transport systems
Sustainable cities	1. Services	1. Public administration, security and defence	1. Social innovation 2. Social innovation with regard to environmental issues

Source: European Commission

⁴⁰ Region Västra Götaland (2011a)

⁴¹ European Commission (2013)

3.5 Possible Future Orientations and Opportunities

The economy in West Sweden is characterised by a number of strong growth areas where the region has specific competitive advantages in an international perspective. The region has had a strong innovation performance and a high level of GDP growth. However, there are several opportunities for further development in order to further develop competitive regional innovation systems and governance structures. West Sweden's future as knowledge-driven region requires innovation and is based on continuous development of knowledge, skills and the effective use of resources.

Evaluations of the future opportunities for Region Västra Götaland's innovation policy highlight that continued investments in higher education and research as well as open innovation platforms are crucial. Four main points can be highlighted as a future orientation: *mobilise higher education and research and invest in open innovation platforms*; *Create easy access to research networks for SMEs*; *Stimulate Clusters and Smart Specialisation*; and *Leadership*.

- **Mobilise higher education and research and invest in open innovation platforms**

Universities and other institutions of higher education should maintain a high international standard, and cooperation between companies and institutions of higher education is crucial for innovation and competitiveness. Three main points can be highlighted:

First, the regions should particularly stimulate **Research and Technological Development (RTD) cooperation between companies and institutions of higher education in the key RTD and innovation areas**. Second, the region should **develop a common West Swedish strategy** with an action plan for a desirable future of higher education and research, which also include questions about attractiveness and access to employment. Third, the open innovation platforms have been successful in improving innovation capabilities of SMEs and supporting them to be competitive on a global market. Efforts should continue to focus on these kinds of initiatives in order to facilitate and promote exchanges between businesses, colleges and universities.

From the regional stakeholders' point of view three main future orientations and possibilities can be highlighted⁴²:

- **Create easy access to the research network for SMEs**

As it has been stated earlier, although regional industry invests heavily in R&D, it is the larger companies within the areas of automotive, pharmaceuticals and ICT that account for the larger part of these figures. This calls for increased cooperation between large companies and SMEs in the region.

One main focus of Region Västra Götaland is to create easy access to research networks for SMEs. The region has been working on developing a new type of RTD and innovation vouchers for SMEs. One example is the programme 'Industrial Dynamics' which aims at supporting SMEs in technology development, business and market development, and finding the right paths within the EU instruments and initiatives, and access to the combined expertise of 12 prominent expert organizations ranging from universities to research institutes and industrial development organisations.

- **Stimulate clusters and smart specialisation**

Smart specialisation has been and will continue to be an important policy tool for the regional authorities. Continued participation in initiatives such as CROSSTEXNET is

⁴² Region Västra Götaland (2010) and interview with Helena Nilsson, Region Västra Götaland

important in order for the region to tie its key business sectors and areas of expertise to EU programmes and smart partnerships. Smart specialisation is also priorities in the regional strategy for Västra Götaland (VG2020). In this regard it is also important to create synergies between regional, national and European strategies and instruments such as structural funds, EU research programmes and regional and national R&D programmes to build smart, competitive clusters.

- **Leadership**

Several of the regional stakeholder emphasise the need for stimulating an ‘ecosystem’ where there are clear leaders. The science parks in the region are an important infrastructure to implement the Research and Innovation strategy where businesses, universities, institutes and public bodies set their agenda jointly and participate in the implementation of actions and initiatives. However, as a next step, these science parks should be given a clearer mandate as “leaders” within their respective areas of expertise. This would, for instance, imply that Lindholmen Science Park would have an even more central function in the field of mobile communication, intelligent vehicles and transportation systems, and modern media industry, both in a regional and national perspective. **A clearer leadership among the strategically priorities areas in the region would help strengthen coordination efforts and create even more favourable conditions for a globally competitive industry.**

- **Synergies between the future orientations and identified challenges**

An important last point is how the four future orientations presented by different stakeholders respond/co-work with three challenges identified in chapter 1.3 (i.e. Increase collaboration between actors in the region, Stimulate entrepreneurship and innovation in SMEs, Upgrade traditional industry)?

With regards to increased collaboration between actors in the region it is clear that through the clusters and smart specialisation initiatives there is a strong focus on strengthening the regional competitiveness through cooperation between regional (and national) actors. Furthermore, initiatives such as RTD and innovation vouchers for SMEs are further strengthening regional collaboration.

The focus of Region Västra Götaland to create easy access to research networks for SMEs also shows that there is an emphasis on stimulating entrepreneurship and innovation outside of the large multinational companies that are present in the region. Such initiatives will help broaden the knowledge base and thus strengthen the innovative capability of the region.

Last, with regards to upgrading the manufacturing industry, this can further be done through the cluster initiatives and through broader collaboration between regional actors (e.g. industry, academia and science parks). Overall, regional development in West Sweden will be dependent on strengthening traditional knowledge base as well as stimulate entrepreneurship and innovation in new areas.

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Appendix B Stakeholders consulted

1. Mats Granér, Manager, Unit for analysis and monitoring, Region Västra Götaland (date of interview 21 October 2013).
2. Helena Nilsson, Manager, Unit for Research, Development and Education, Region Västra Götaland (date of interview 21 October 2013).
3. Susanne Hammarström, Position?, Västra Götalandsregionen Regionutveckling, (date of interview: 31 October 2013)
4. Niklas Wahlberg, CEO, Lindholmen Science Park AB (date of interview 8 November 2013).
5. Peter Zienau, CEO, Innovatum (date of interview 12 November 2013).

Appendix C Statistical Data

	SE23 West Sweden	Country	EU27	Year	Performance relative to	Performance relative to
	SE23	SE	EU27		EU27	SE
ECONOMIC INDICATORS						
GDP per capita (Euros)	35300	37300	24500	2010	144,1	94,6
GDP growth rate - (2000-2010)	2,61	2,69	2,93	2000-2010	89,2	96,9
Long term unemployment rate	1,31	1,36	4,14	2011	316,0	103,8
Labour productivity growth (%)	1,71	1,84	2,20	2000-2010	77,7	92,6
RCI 2013	0,59	0,44	0,00	2013	139,2	107,6
Share of employment in agriculture	0,02	0,02	0,05	2011	37,2	93,0
Share of employment in industry (including construction)	0,22	0,20	0,25	2011	89,1	112,3
Share of employment in business	0,27	0,28	0,30	2011	89,5	96,4
Share of employment in public sector	0,32	0,32	0,25	2011	129,3	99,4
Share of employment in S&T	0,12	0,12	0,09	2011	130,5	94,0
RESEARCH & TECHNOLOGY INDICATORS						
Employees with ISCED 5-6 (% all employees)	34,7	35,5	30,4	2011	113,9	97,7
Business R&D (% GDP)	990,8	873,6	304,3	2010	325,6	113,4
Government R&D (% GDP)	0,12	0,15	0,26	2010	46,2	80,0
Higher Education R&D (% GDP)	0,83	0,88	0,49	2010	169,4	94,3
EPO patent applications (per mln population)	271,87	294,51	114,99	2008	236,4	92,3
Employment in medium-high & high-tech manufacturing (% total employment)	6,51	5,17	6,39	2011	101,9	125,9
Employment in knowledge-intensive services (% total employment)	47,66	49,59	35,32	2011	134,9	96,1
Total R&D personnel (% active population) - numerator in head count - all sectors	2,49	2,34	1,53	2010	162,7	106,4

	SE23 West Sweden	Country	EU27	Year	Performance relative to	Performance relative to
Structural funds on business innovations (Euros per mln population)	21,90	76,65	77,74	2007-2013	28,2	28,6
Structural funds on core RTDI (Euros per mln population)	12,99	49,44	63,01	2007-2013	20,6	26,3

LABOUR PRODUCTIVITY

B-E - Industry (except construction)	85.730	92.864	71.853	2010	119,3	92,3
C - Manufacturing	75.987	78.973	56.378	2010	134,8	96,2
F - Construction	47.227	48.208	43.792	2010	107,8	98,0
G-I - Wholesale and retail trade, transport, accomodation and food service activities	55.073	55.027	37.843	2010	145,5	100,1
J - Information and communication	79.421	84.118	79.994	2010	99,3	94,4
L - Real estate activities	353.341	354.660	387.941	2010	91,1	99,6
M_N - Professional, scientific and technical activities; administrative and support service activities	53.911	56.422	39.717	2010	135,7	95,6

BUSINESS INNOVATION INDICATORS

Technological (product or process) innovators (% of all SMEs)	0,57	0,39	0,40	2008	143,1	145,8
Non-technological (marketing or organisational) innovators (% of all SMEs)	0,43	0,32	0,38	2008	113,7	134,0
Innovative SMEs collaborating with others (% of all SMEs)	0,61	0,47	0,37	2008	164,3	130,6
SMEs innovating in-house (% of all SMEs)	0,62	0,45	0,39	2008	159,6	139,1

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