

SPIN Country Report Sweden



SPIN Country report for Sweden on Innovations for sustainable production in and from SMEs

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1 Introduction

This report focuses on the situation for innovation in small and medium-sized enterprises (SMEs) as well as the pre-requisites in Sweden. It is part of the SPIN project, “Sustainable Production through innovation in SMEs”. The European aspects are covered in the German country report and thus not included specifically, although mentioned in some parts, as European pre-requisites influence the situation in Sweden. This report does not cover all different aspects in detail but rather gives an overview over important issues that have been brought up in relevant reports and discussions.

2 Overview of SME sector

2.1 SME definition

The EU commission defines SME an enterprise employing up to 250 people and a business volume of up to €50 million. Moreover, in order to still fit this category, the enterprise must not be owned by a company to more than 25 % which itself does not fulfil the SME criteria. In Sweden, there are more than 500000 SMEs whereas there are less than 1000 large companies. The majority of SMEs 493 601) are micro SMEs with 0 to 9 employees, which exhibit a business volume of less than €1 million per year (Table 1). This means that 94 % of all companies count 9 or less employees.

Type	Number of enterprises		Number of employees		Value added (MEUR)	
	Value	%	Value	%	Value	%
Micro	493 601	94,2	655 836	24,9	30 267	20,2
Small	24 880	4,7	538 988	20,4	26 089	17,4
Medium	4 414	0,8	472 135	17,9	26 859	17,9
SMEs	522 895	99,8	1 666 959	63,2	83 214	55,5
Large	953	0,2	971 301	36,8	66 552	44,4

Table 1: Enterprises in Sweden (2007), ordered by number of employees and yearly turnover and value added (all branches)

Apparently, the situation of such companies differs a lot from bigger enterprises with 50, 100 or more employees, although, all these companies are referred to as SMEs. The European Committee of Economy and Social Affairs consider this undifferentiated definition as obsolete and one of the main causes for failure of SME programmes.

2.2 Contribution of SMEs to economic performance

99.8 % of all companies in Sweden are SMEs which is equal to the EU average. 63.2 per cent of the work force is employed in SMEs, developing 55.5 % of all net value-added.

According to the European Commission, the Swedish SBA (Small Business Act) profile shows figures in all categories that either equal or surpass the EU average (figure1). Particular strengths are “Finance”, “Skills and Innovation” and “Internationalisation”. Areas where Sweden equals the EU average are “Entrepreneurship”, “Public Administration” and “Single Market”.

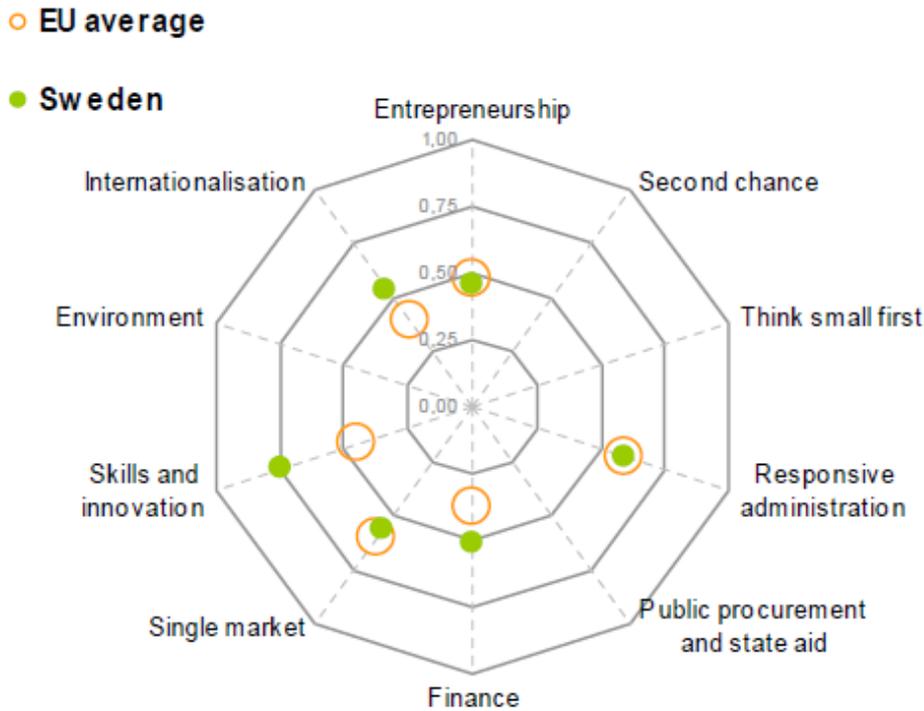


Figure 1: Swedish SBA profile (SBA fact sheet Sweden, with information from European Commission, DG Enterprise)

2.3 Environmental impact of SMEs

No specific information could be found regarding the SME contribution to the environmental situation. The information available regarding environmental aspects such as emissions or discharges, waste forming and emission of greenhouse gases is not divided into the size of companies.

The environmental impact from SMEs is strongly related to the type of activity. In production companies, resource use and emissions from production are often important, for service companies it might be transport or the office ventilation system.

During the last 25 years the share of the total pollution which originates from industry is steadily decreasing compared to pollution from traffic, energy production and households.

2.4 SMEs relation to eco-innovation

The interest to introduce new products or production processes in general is limited in SMEs as the results of the inquiry reported in “Conditions and reality of enterprises 2008” (“Företagens villkor och verklighet 2008”) show.

Willingness to introduce new products:

Yes	40 %
No	60 %

Willingness to introduce new production processes:

Yes	20 %
No	80 %

Although the interest in general is limited, many innovations are developed in Swedish SMEs. They also cover many different branches. A study of the factors behind the success of the innovations that took part in the finals of the Swedish Environmental Innovation Competition between 1998 and 2004 (more than 100 innovations) has been published by Vinnova in 2008. The innovations studied were in the early stages of development: seed, start-up and initial expansion. The commercial success of the innovation was not dependent on the technological field, the industry in which the innovations were developed or customer sector, but mostly on the innovator and the environment in which he/she works. Entrepreneurs professional in the specific branch of the innovation produced the largest number of commercially successful innovations, compared to specialists from university or external to university.

Fawzi Halila found in his doctoral thesis a number of factors of importance for successful innovations, where also put a special emphasis on SMEs. Overestimation of the own innovation has to be avoided. Access to financing/capital is important and networking in relevant networks. In his theses he also looked at the implementation of environmental innovations in SMEs and concluded it a difficult task. To be a part of and use a network is a possible way to facilitate the adoption process.

More about the uptake of new solutions in SMEs is described in 5.3.4.

3 Framework situation

3.1.1 Regulation/Legislation arrangements

Regulation and legislation is important for SMEs in many ways, although legislation can be and often is independent of the size of a company. SMEs have been identified as an important driver of the Swedish economy. Therefore they are addressed in a number of actions by the government. A recent example is the proposition to facilitate the auditing process for smaller companies, as auditing and financial reporting is regarded as a specific burden for many smaller companies. Rules and regulations are otherwise often regarded as an obstacle for innovation and growth especially in micro businesses.

Regarding requirements for environmental impact of a business, there are four levels of for a registered enterprise depending on the size and type of operation. (Except legislation regarding employment, taxes, etc.)

- Company with, no environmental risk: No regulations.
- Company with small environmental risk: Registration to municipality (Example: engineering industry).
- Company with medium environmental risk: Permit from County Administrative Board (Example: metal surface treatment).
- Company with large environmental risk: Permit from Environmental Court (Example: steel works, pulp and paper works).

As it regards, environmental permits, this can be adapted specifically to the situation of the emission and its location. Permits are also dependent on the type of business, e.g. as it is described in the IPPC directive which has also implications for smaller companies.

A government bill on research and innovation has been proposed. It includes e.g.

- Increased funding for research,
- A new model for innovation system introduced,
- Establish innovation offices at some universities to commercialise research innovations
- Further development of co-operation programmes between business and research.
- Strengthen industrial research institutes

Systemic and sustainable thinking is not widely implemented in legislation and regulations.

3.1.2 Market/ Business drivers

The overview on innovation, entrepreneurship and growth, done within the IVA (Royal Engineer Science Academy, Kungliga Ingenjörsvetenskapsakademin) project on Innovation for growth points at a number of pre-requisites for successful innovations. Innovation is not seen as a linear process, but rather a matrix that needs interaction of different actors to be successful. Important roles are:

- A visionary that has the idea
- An entrepreneur that organises to put the idea into practice
- A salesman to commercialise the idea
- A financier to finance the product development
- Customers that demand new and innovative solutions.

Innovation is seen as a rather complex process with iterations to get a successful innovation. An innovation system can facilitate the innovation process. Such a system consists of components and their relationships. Important components are:

- Knowledge, e.g. R&D, education
- Demand factors, e.g. creation of new product markets.
- Organisation and relationships, e.g. support of entrepreneurship, new product groups for a company.
- Support for innovative companies, e.g. incubators, financing, technology transfer from institutional research to companies

Furthermore the report points out that innovation is combined with risk, e.g. it is not sure if a specific research will lead to a new commercial product.

In general, drivers for innovations are a better satisfaction of demands or new demands, as it can arise from new needs. Such needs can be generated for example by legislation or by needs or opportunities for increased efficiency. A typical situation is a change in conditions by either legislation or a shift in the market, creating new demands and thus opening for innovative solutions. Another reason for innovation is the possibility to reach new markets, which can be both regional, i.e. national or international, and new branches and types of customers. In many successful cases, new innovations have been developed in co-operation with a customer.

Vinnova produced a report on environmental innovations in 2001. Within this report, market needs and official requirements, rules and laws are identified as most important.

Competition and increased market share are market drivers. The drivers can differ between sectors. In mature sectors, increased efficiency is higher ranked than large changes.

Smaller companies are often more reluctant to environmental innovations and react mostly to external factors like laws and regulations. A preliminary result of the study was that policy instruments often only had limited effects on innovation. Technology forcing standards could hold the largest potential for radical innovations, but sometimes at a large cost to the firms

3.1.3 Financial Aspects

Financial aspects are important for innovation in SMEs. They are sometimes regarded as a minor problem (Conditions and reality of enterprises 2008) and sometimes as more important (The view of Swedish SMEs on innovation and R&D-obstacles and opportunities). In case external funding is needed for development and commercialisation of an innovation, this can be a problem.

There are a number of financial support schemes and actors that support SMEs in their innovation process, in most cases support is general on innovation, not only sustainable innovations. More information is provided in chapter 7.4.

For example, the Swedish Governmental Agency for Innovation Systems, Vinnova, funds the needs-driven research. There are also other authorities that support SMEs, e.g. the

Swedish Agency for Economic and Regional Growth and for the energy sector the Swedish Energy Agency.

Also private actors from Sweden and abroad invest in innovations developed in Sweden.

The law on public procurement influences the possible market for innovations. Public procurement is an important possible market for innovations. Although, in public procurement, often standard solutions are prescribed, making it difficult for innovative alternatives to succeed.

3.1.4 Enforcement degree

The degree of enforcement in Sweden is relatively high. The specific measures for companies to follow depend on their size and environmental impact, see 3.1.1.

Inspections of companies with any environmental risk are carried out by municipalities or county administrative boards on a regular basis. Companies with a permit report annually to their inspection body. To some extent the system is based on self-declaration.

As Sweden is part of the European Union, the Swedish legislation is influenced by the rules set by European legislation.

4 Methodology

The methods used to collect information for this analysis have been:

- A literature survey
- Contact with the Swedish Agency for Economic and Regional Growth
- Contact with VINNOVA - Research and Innovation for Sustainable Growth
- Contact with Swedish Environmental Protection Agency
- Contact with branch organisations (Engineering industry, Surface Treatment Industry, Hot Dip Galvanizing industry, Painting industry, and other)
- Survey of EU IPPC BREF Documents
- Survey of Nordic Council of Ministers BAT Documents

The information has been collected and assessed and afterwards condensed in this report.

5 Needs

There are many factors that influence the competitiveness of small and medium-sized companies. Innovation and the capability to develop a companies business are some of these important ones. SMEs are a very heterogeneous group, e.g. with regards to size, branches, financial background, market etc. Therefore the needs can differ between different groups of SMEs.

In this chapter, if not stated differently, answers with percentage values are referring to the report Conditions and reality of enterprises 2008 ("Företagens villkor och verklighet 2008") by Swedish Agency for Economic and Regional Growth, a result from a survey covering 18 201 statistically selected SMEs.

A general overview of the main obstacles is provided in the following figures, derived from two different reports, although they are not directly covering innovation, but growth and R&D (research and development), which is broader than innovation, and R&D, which is only a part of innovation.

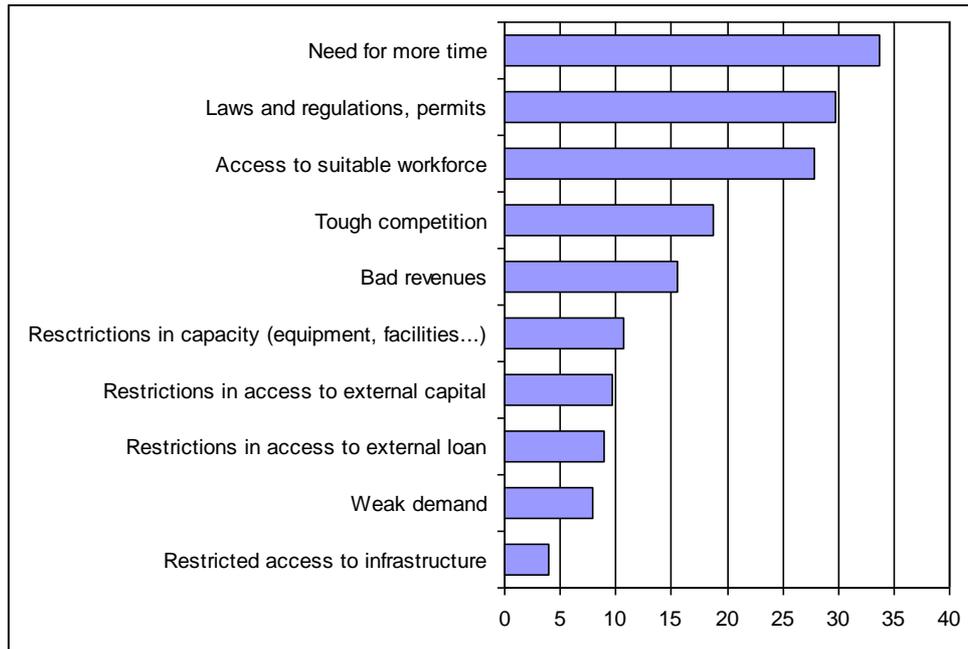


Figure 2: Main obstacles for growth in SMEs according to inquiry in Sweden (“Företagens villkor och verklighet 2008” (Conditions and reality of enterprises 2008) by Swedish Agency for Economic and Regional Growth.

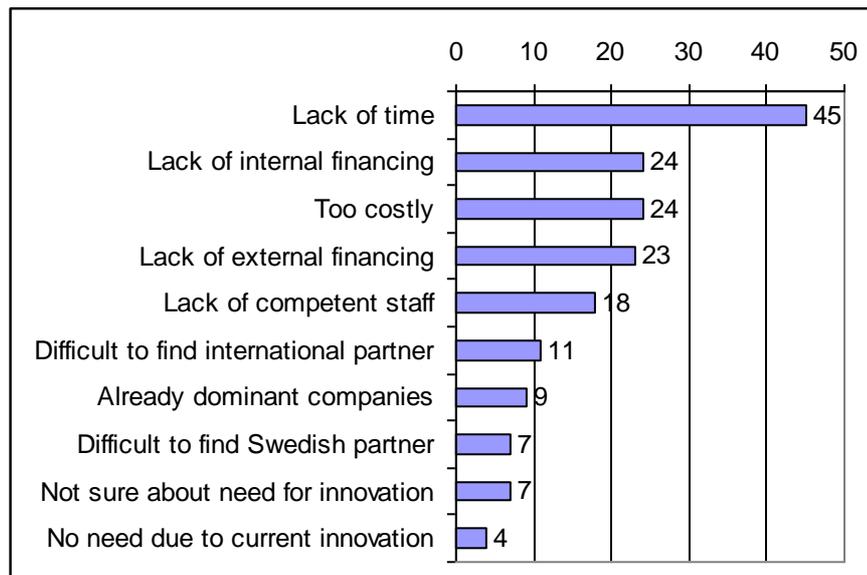


Figure 3: Main obstacles for using more R&D in SMEs according to inquiry in Sweden (“Svenska småföretags syn på innovationer och FoU-hinder och möjligheter” by SEB and Vinnova, 2007)

From these and other sources, it can be seen, that there are a number of typical needs for providing SMEs better possibilities for innovations:

- Help, e.g. by new tools, to reduce lack of time
- Improve access to internal and external financial support / capital
- Improved internal competence and increased willingness to introduce innovations
- Increased competence in networking and in utilizing research results including better connection to academic research,

- Better access to competence in intellectual property IP
- Support for demonstration including verification and export
- Easier access to, and a clearer picture of, governmental programs for SMEs

As a number of different competences complete each other for successful innovations, these competences have to be present either in-house or by networking or cooperation.

SMEs in different branches have in general different main environmental impact categories. For sustainable innovations also economical and social aspects are important. The following subchapters give some more information on dedicated needs.

5.1 Financing

5.1.1 Start-up

The financing of start-up companies is difficult, as their product usually is not proven on the market. Many companies do not have enough own capital. New companies are usually not on the stock market, they need to get financing via venture capital, from banks or other sources. As start-up companies are difficult to assess, it is not easy to get loans from banks.

The start-up is also difficult as the innovation has to be “translated” into a product with a competitive price.

Start-up support is available e.g. from the Swedish Agency for Economic and Regional Growth (Tillväxtverket).

5.1.2 Development projects (e.g. for development of new products/services)

For development projects, access to financing and competence is important as well as the companies capacities like knowledge and equipment.

There some financing schemes for development projects available, but far from all companies are aware about them.

5.1.3 Capital

Capital is needed e.g. for investments. It can be own or external capital. According to the obstacles for growth inquiry, many SMEs do not regard access to financing as a main obstacle:

No obstacle	64 %
Small obstacle	27 %
Large obstacle	9 %

In the SEB/Vinnova inquiry, lack of internal and external financing is an important factor for not performing R&D for innovation.

5.1.4 Insurances

Insurances are needed especially for international business in a number of countries in order to minimise the risk of international business.

The Swedish Export Credits Guarantee Board (EKN) offers a number of guarantees for exporting companies, to make sure that Swedish companies and banks get paid when they export.

- Basic guarantee for small and medium-sized companies - for market risks.
- For contract guarantees.
- For production
- For credits

5.2 Competences

SMEs in general and especially Micro Enterprises have difficulties in introducing new technology solutions and organization ideas or finding suitable employees because of:

- Lack of time

- Unclear division of responsibility within the company
- Lack of competence.

The type of competence needed is depending on the size and type of the enterprise and in what field it is operating.

Cooperation with universities and research institutes is a possibility to strengthen the competence, but there are often misunderstandings. Both SMEs and research performers need to learn how to communicate with each other.

Although there is not always a direct need for higher competence, many smaller companies that employ engineers with higher education have performed better afterwards.

In the study of the factors behind the success of the innovations that took part in the finals of the Swedish Environmental Innovation by Vinnova. Four groups of innovators have been identified:

- Entrepreneurs professional in the specific branch of the innovation;
- Specialists external to the university environment;
- General technologists external to the university environment;
- Students and researchers from the university environment.

The first group was the most successful reported in the study suggesting it to be a competence facilitating innovations. The innovator and the environment in which he/she works are the most significant factors.

According to the survey “Conditions and reality of enterprises 2008” by Swedish Agency for Economic and Regional Growth, the following general percentage values were found.

5.2.1 Employees

A significant percentage of SMEs perceives difficulties to find suitable employees:

No obstacle	40 %
Small obstacle	32 %
Large obstacle	28 %

5.2.2 Organisation

Most companies answer that they hesitate to introduce new organization ideas:

Yes	20 %
No	80 %

5.2.3 Culture

No specific information to this issue was available, but there is not one typical group of SMEs, but a number of different types with different cultures. For example, enterprises in a growth phase are often more actively working with innovations.

5.3 Business and Market

5.3.1 Market formation

A number of factors that influences the market formation are:

- Uncertainties of needs among potential customers
- Inadequate knowledge of relations between investments and benefits
- Lack of competence and poor articulation of demand
- Lack of standards.
- Scepticism against new and unknown solutions

5.3.2 Brand awareness and associations (e.g. eco-labelling)/ how and where to do marketing

The situation on branding of products is not a common for all SMEs. There are many SMEs that are not working with a specific branding of their products, while others are.

The use of environmental labelling and management schemes is restricted among Swedish SMEs, although more have some kind of environmental and quality management scheme:

ISO 14001	6.6 %
EMAS	0.2 %
Eco-labelling	4.3 %

5.3.3 Cooperation with other enterprises

Cooperation with other companies is common among SMEs. Upon the question if they cooperate with other companies on a regular basis, the SMEs answered:

Yes	61 %
No	39 %

The reason for not cooperating is mainly that there is not a perceived need:

Demands too much time and effort	4 %
Difficult to find partners	5 %
No need or cannot see any benefits	30 %

Investigations have shown that companies that cooperate with other companies are doing better.

Cooperation with other companies is still restricted on the international level and could be improved.

5.3.4 Establishing new solutions

In general, tested and verified solutions are often preferred to new and innovative ones, especially well established solutions are used both by companies and authorities.

There are a number of possibilities to help innovation uptake. Innovations are well taken up if they clearly can satisfy a need better than existing solutions. Another example is verification of new solutions in order to increase confidence by independent testing. A third opportunity is development of new solutions in cooperation with customers.

Public procurement can be a strong instrument to strengthen the introduction of innovative solutions on the market. In Sweden, public procurement has not been used systematically for innovation procurement.

5.3.5 Market analysis

Doing market analysis is an important step during development of sustainable innovations. A number of SMEs work in cooperation with customers during development, thus assuring a potential market. For other new solutions, a dedicated market analysis is necessary, especially when looking for an international market.

The investigations that have been performed by different agencies focusing on innovation have not specifically looked into sustainable innovations.

5.4 Intellectual Property Rights (IPR)

Protection of intellectual property is of vital importance for SMEs with cost intensive innovations. Many SMEs are lacking the financial strength and competent personnel to determine and handle these issues as well as control and enforce claims.

It is important not only to look at patents, but also at specific know-how, trademarks, image etc.

IPR issues are especially important for the global market, but also expensive, so patenting is not always the right solution. For European patents, translation has to be paid for each country, but improvements are on their way.

5.5 Branches with environmental impact

Below a number of branches with their typical environmental impact and possible need for improvement are listed. The list is focusing on a number of branches that could be

addressed within the SPIN project and gives an overview on typical environmental issues. As the Swedish SPIN partner has taken the responsibility for organising a workshop in the field of surface treatment, there is focus on this sector.

5.5.1 Metal surface treatment industry:

Cleaning/degreasing, new metal-working chemicals are difficult to remove with conventional degreasing chemicals. Waste water handling.

New processes and materials, general for metal surface treatment there is a need for more environmental friendly processes and materials.

Energy saving issues, i.e. heat recovery

5.5.2 Hot dip galvanizing industry:

Passivation (white rust protection) for newly galvanized products.

Fluxing, flux residues often cause corrosion problems on specific constructions.

Energy saving issues, heating of zinc tank, temperature control, etc.

5.5.3 Paint shops:

Drying and baking, painting requires both heating and cooling, there is a need for development of energy efficient equipment for this purpose (heat pumps etc.).

Energy saving issues, i.e. recovery of waste heat.

5.5.4 Other:

Engineering and Metal working industry

Problems: Hazardous waste; metalworking fluids, VOC, energy saving, waste water

Smitheries

Problems: Energy saving, emissions, noise

Foundries

Problems: Energy saving, emissions, smell, dust, hazardous waste

Glass industry

Problems: Energy saving, (polluted soil)

Wood preservation industry

Problems: Hazardous waste, chemicals, polluted soil

Rubber and Plastic industry

Problems: Hazardous waste, chemicals, smell, VOC

Chemical industry

Problems: Hazardous waste, chemicals, smell, waste water, VOC

Printing industry

Problems: VOC

Tanning industry

Problems: Hazardous waste, chemicals, smell, polluted soil, waste water

Textiles industry

Problems: Hazardous waste, chemicals, waste water

Farming

Problems: Eutrophication

Slaughterhouses

Problems: Waste, waste water

Diary industry

Problems: Waste, waste water

Food industry

Problems: Waste, waste water

Fishing industry

Problems: Eutrophication

6 Barriers

Sweden is still regarded as the most innovative country in Europe according to the innovation Scoreboard for 2009, but also in Sweden the situation can be improved. A majority of R&D investments is done in large companies and the Swedish innovation system is dependent on their work and investments. In order to improve the competitiveness it is important that Swedish SMEs invest more in innovations and R&D.

According to the Scoreboard investigations, Sweden is less well performing when it comes to commercialisation of innovations. Another area that can be improved is investment in resource efficiency.

Many innovative SMEs look at innovations and R&D as an important part of their business as well as an important part of their future development. On the other hand many SMEs are not working with R&D or innovations. The most common type of innovation is improvement of existing products.

A main obstacle for further investment in innovations and R&D are especially lack of time and also financing.

6.1 Financing

Although there are a number of different opportunities to get official financial support for innovation in SMEs, these are not always known well. A better co-ordination between different programs and activities is necessary.

A large majority, more than 80 per cent of the SMEs is according to the investigation "Swedish SMEs view on innovations and R&D" financing R&D and innovation with own capital. On the other hand, in the same investigation, lacks of internal and external financing as well as too high costs are mentioned as some main obstacles for innovation.

A possible tool facilitating R&D and innovation work has been proposed: Removed tax on R&D, especially for SMEs.

Another problem for SMEs has been to get loans or guarantees for their smaller affairs, especially for the international market. This problem has been looked upon and now there are at least some instruments more open to smaller investments abroad.

6.2 Competences

Innovations are achieved by a cooperation of several actors, often involving suppliers, customers, sometimes research organisations or universities. Today, only a few SMEs have close cooperation with research institutes or universities. Many companies would like to improve cooperation, but find it difficult to find the right way to contact the research providers. There is a need for better support to find the right competence. In order to be able to incorporate the knowledge, there is a need for competence at the SMEs in asking for knowledge as well as in networking with research institutions. These institutions in turn need to emphasize the market demand in their research and have to communicate to SMEs in a better way. So far, there are only limited incentives for universities to share their competence to the benefit of SMEs. SMEs have mentioned a lack of information about ongoing research. The same need to match demand and supply of research has also been identified in the evaluation of the innovation needs for the energy sector.

Many micro-companies, especially those in a growth phase, have a larger percentage of higher educated people employed. Higher education is often needed in companies that work with innovation and R&D

According to the report on successful environmental innovations, an important competence for success in innovation is entrepreneurial know-how in combination with an understanding of the needs of the customer and the conditions of the particular branch.

6.3 Business and Market

Technology procurement and cooperation between private and state-owned organisations have been important instruments for innovation. Public procurement is today not sufficiently supporting innovative solutions from SMEs, due to regulations and long term contracts. Innovation procurement could be a solution.

There is a connection between growth and export and investments in R&D and innovations from companies. Growing companies invest more in R&D and innovations and they do export more compared to other companies. There is a need to strengthen international networks to facilitate export of new solutions.

There is also a strong need to overcome the scepticism towards innovative solutions. Verification of technologies has been proposed as one possible measure. For example the evaluation of measures for innovation in the energy sector points at technology verification to assess if a technology performs as it is needed.

Both private and public customers often demand well established solutions to minimise the risk of investments. Although there are some instruments, e.g. the EU LIFE+ programme, that can reduce the risk, these could be used better. Authorities responsible for permits are often prescribing existing solutions, which could be for reasons of minimising risk or lack of understanding of new solutions. Therefore, a way to open up for new solutions in permitting would be helpful for access to market. For example the Best Available Technology Reference documents are often used to determine which technology should be used, and often only the exact technologies mentioned in the documents are allowed, although mentioned otherwise in the BREF. A system to integrate sustainable innovations at least as emerging technologies would be helpful.

Especially within the international market, there is strong competition, which increases the need for competitive and innovative solutions. Too strong or weak local legislation has an impact on the competitiveness. If it is too strong, companies have difficulties to stay, if it is too weak, the international competitiveness gets lost.

6.4 Intellectual Properties Rights (IPR)

The global competition implies shorter product cycles, which also increases the need for innovations and protection of these by intellectual property rights (IPR).

Many companies lack access to competence in this field and are in need for support.

An evaluation of the situation in the energy sector revealed a strong demand for better knowledge regarding patents and IPR, which many companies would like to be provided by the Energy Agency.

There is a perceived risk to contact authorities for specific questions and by this revealing details of solutions for the authority and possibly competitors. Therefore some companies do not apply for support. Thus a balance between open access to information in order to foster broad uptake of new solutions and minimising IPR risks for companies has to be found.

Protection within EU is costly, especially as patents have to be translated into all languages where the patent should be applicable. A harmonised EU patent system has been asked for and seems now in its way.

6.5 Other barriers

The main barrier mentioned for SMEs in several investigations and inquiries is the lack of time. Many SMEs have only a few employees, which means that single persons have to cover different tasks. This implicates difficulties to plan innovation processes, if it is not an integrated part of the company. Some possible solutions are: reduced burden on official tasks like auditing, providing tools that facilitate the work with innovations, and networking for common tasks.

7 Incentives

7.1 Regulatory and normative framework

Legislation has a significant impact on the SMEs business. Many of the European aspects have been covered in the German country report. In general, new directives, but also permits create the need for improvement. A directive with large consequences at the moment is REACH, which aims to give better control over handling of chemicals.

Tougher regulations can be an instrument to facilitate implementation of innovative solutions and even technology shifts, but they can also add an additional burden.

As development of new solutions takes time, it can be advantageous to have a longer time frame especially in individual permits when new solutions are under development for specific cases.

The Vinnova study on environmental drivers of environmental innovation notices a lack of information about how regulations impact on environmental innovations.

7.2 Market-oriented schemes

As a result of the evaluation of innovation within the energy sector, the difficulties to provide venture capital especially for innovative and new started enterprises have been identified. The Energy Agency sees a need for further work in this area, in order to provide loans to such companies at an early stage.

A possible incentive to improve R&D and innovation in SMEs that is discussed at the moment is to remove tax on R&D.

Further official incentives are described in 7.4.1.

7.3 Public procurement

In general, public procurement is not supporting sustainable innovations, but rather existing solutions. There are considerations to improve this situation and work for innovation procurement.

7.4 Financial and institutional support measures

7.4.1 *Financial support measures:*

There are a number of support measures for SMEs from different organisations. The **Swedish Agency for Innovation Systems, Vinnova** provides a number of different tools:

- Forska&Väx (Research and Grow) creates growth by investment in R&D and innovations in SMEs, both needs assessment, pre-studies, and R&D and development projects can be funded
- VINN NU (Win now) – business development for new enterprises
- EUREKA/EUROSTARS – development cooperation between companies, SMEs and larger companies can be involved, in Europe
- SMINT –pre studies for SMEs for technological cooperation in EU programmes
- VINNVÄXT (Win-growth) has the aim to promote sustainable growth by developing internationally competitive research and innovation environments in regions and for specific growth fields

- VINN-Verifiering (Win-verification) for technical and business verification of research results with business potential.
- Environmental Innovations: Specific call (2009) with focus on R&D, demonstration projects, business models, and system studies.

The **Swedish Agency for Economic and Regional Growth** provides a number of support measures, e.g.:

- The programme on environmentally driven markets, where it is possible to get funding for:
 - Development of company networks
 - Advice for environmentally driven business development
 - Development of system solutions
 - Coordination and support for procurement
- Demo Environment: Pre-studies and demonstration projects for export of environmental technology to a number of countries,
- Product development in SMEs: supports development of new products

There are also a number of **European schemes** that complete the Swedish actors and financing schemes. Some of them are:

- Competitiveness and Innovation Framework Programme (CIP) supports innovation activities (including eco-innovation), provides better access to finance and delivers business support services. Within the CIP programme there are for example:
 - Equity financing: The high growth and innovative SMEs (GIF)
 - Guarantees: The SME guarantee facility (SMEG)
 - Calls on eco-innovation for market replication
- FP 7 for Research projects, where often SME participation is explicitly wanted.
- LIFE+ for innovation and demonstration projects in the field of environment

The **foundation for strategic environmental research, MISTRA**, supports research of strategic importance for a good living environment. MISTRA has a programme called ProEnviro, together with **Swedish Foundation for strategic Research (SSF)**, for ecofriendly product development in SMEs. SSF also has the programme PROVIKING for product development in SMEs.

Furthermore, a number of venture capital funds exist.

7.4.2 Institutional support

There are a number of institutions and networks that support SMEs in their work for sustainable innovations, although often the support is generic for innovations. Some examples are:

- Incubators, e.g. those in SiSP – Swedish Incubators & Science Parks – a national interest organization that is owned and operated by 95% of all Incubators and Science Parks in Sweden. A list of incubators and science parks can be found in the annex.
- Environmental technology networks like
 - ASSET, Sustainable Business Hub,
 - Swedish Environmental Technology (SET)
 - Sustainable North Sweden,
 - Sustainable Sweden Southeast,
 - Sweden Cleantech Incubators
 - etc.

- Innovationsbron, owned by the State and Industrifonden, focuses on turning research and innovation into business, and has an incubator programme with many of the above mentioned incubators involved. Innovationsbron is active for example in the activities:
 - HINT- an EU financed project for sustainable innovation and growth in western Sweden
 - Cleantech Inn Sweden- a national project to support cleantech innovations
- ALMI Company partner offers financing of innovation projects, new companies and established companies that want to develop. They also offer innovation advice.
- Swedish Research Institutes like:
 - IVL Swedish Environmental Research Institute
 - SP Technical Research Institute of Sweden
 - Innventia (pulp, paper, graphic media, packaging and biorefining)
 - JTI (Swedish Institute of Agricultural and Environmental Engineering)
 - Swerea (materials, process, product and production technology)
 - Swedish ICT research
- Universities
- The Enterprise Europe Network (http://www.enterprise-europe-network.ec.europa.eu/index_en.htm) provides regional contact partners to help SMEs with:
 - Develop business in new markets
 - Source or license new technologies
 - Access EU finance and EU funding

7.5 Awareness raising and demonstration measures

There are a number of training programmes and education possibilities, most of them target innovation or production efficiency in general. One example is KK-stiftelsen, which together with other partners operates “Produktionslyftet”, with the aim to improve efficiency in production in SMEs (www.produktionslyftet.se, in Swedish)

A specific programme for demonstration of innovative solutions is the European LIFE+ programme, where up to 50% financing is provided. Another instrument is DemoEnvironment, support for demonstration of environmental projects in other countries, by The Swedish Agency for Economic and Regional Growth.

7.6 Strategic planning and foresight

At the moment the Royal Swedish Academy of Engineering Sciences (IVA) is leading a project on Innovation for Growth, where different issues to foster innovation in Sweden are addressed. Stakeholders from both authorities and business are part of this project.

Two agencies, the Swedish Agency for Innovation Systems and the Swedish Agency for economic and regional growth are working with these issues in their daily work.

8 Conclusion

The situation for sustainable innovations for and from SMEs in Sweden is complex. It is influenced by national, EU and international conditions. Findings from investigations that have been checked for this report can be summarised as follows.

8.1 Situation/needs:

- In many cases, either innovation is addressed or sustainable development, but very seldom sustainable innovation.

- Investments in R&D and innovations are important for many companies including SMEs
- Lack of time is a main obstacle for innovation work in SMEs, lack of financing often another one.
- The cooperation between researchers and SMEs needs to be improved
 - Better understanding needed from both sides
 - Market relevant research
 - Knowledge on how to “order” research is needed in SMEs
- Many SMEs lack access to IPR competence, improvement is needed.
- Public procurement is not supporting innovative solutions sufficiently so far.
- A relevant number of SMEs see no direct need for improvements related to their products or processes, although there might be opportunities for innovative solutions.
- Many SMEs do not make use of the available funding and support systems
- It is difficult for SMEs to get an overview about the available support systems and tools. SMEs have been recognised as important for innovation. Tools are created or adapted to fit the need of SMEs, which probably will show effect in near future.

8.2 Incentives and possible improvements

- There are a number of supporting tools available today for financing as well as expertise, e.g. those described in chapter 7.4
- SMEs need better help, to reduce their lack of time, e.g. by new tools or time saving regulation, i.e. less administration
- Improve access to internal and external financial support / capital for SMEs
- Competence is a key factor, meaning that different competences and “roles” are needed for successful innovations. Possible measures are to
 - improve internal competence
 - increase competence to increase willingness to introduce innovations
 - Increase competence in networking and in utilizing research results including better connection to academic research,
 - Provide better access to competence in intellectual property IP
- Support for demonstration of innovative solutions including verification and export, which is only partly available
- Public procurement should support sustainable innovations.
- Easier access to, and a clearer picture of, governmental programs for SMEs. Some work has started to overcome this, e.g. “No Wrong Doors”

9 References

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- The adoption and diffusion of environmental innovations. Fawzi Halila. Doctoral Thesis. Luleå University of Technology. 2007:42

10 Internet links

A number of possibly useful internet links (summer 2010, some of them only in Swedish):

Almi	http://www.almi.se/
ASSET	http://www.miljoteknik.org/home.html
Cleantech Inn Sweden	http://www.cinns.se
EKN, The Swedish Export Credits Guarantee Board	http://www.ekn.se/
Enterprise Europe Network (SWE)	http://www.enterprise-europe.se/hjalpmeny/inenglish
EU 7FP	http://cordis.europa.eu/fp7/home_en.html
EU Life+	http://ec.europa.eu/environment/life/index.htm
EU-CIP	http://ec.europa.eu/cip/
Exportrådet (Swedish Trade Council)	http://www.swedishtrade.se/
Innovationsbron	http://www.innovationsbron.se/
Mistra	http://www.mistra.org/
PRV (Patent & Registration office)	http://www.prv.se/
SIPS (incubators and science parks)	http://www.sisp.se/web/SiSP_in_English.aspx
Swentec (incl. envir. techn. networks)	http://swentec.se/en/
Tillväxtverket (Swedish Agency for Economic and Regional Growth)	http://www.tillvaxtverket.se/
Vinnova	http://www.vinnova.se/en/

11 Appendices

11.1 Appendix 1 Incubators and Science parks

Some of the Swedish Incubators and Science parks:

- Borlänge Science Park, Framtidsdalen
- Borlänge Teknikdalen Foundation Business Incubator
- Borås ESPIRA Tillväxtcenter i Sjuhärad
- Eskilstuna Munktell Science Park
- Eskilstuna/Västerås Create Business Incubator Mälardalen AB
- Eskilstuna/Västerås Idélab
- Gävle Gävle Technonolgy Park
- Göteborg Encubator
- Göteborg Chalmers Innovation
- Göteborg Föreningen Framtidens Företag
- Göteborg GU Holding
- Göteborg Lindholmen Science Park
- Göteborg Sahlgrenska Science Park
- Halmstad Science Park Halmstad
- Jönköping Science Park Jönköping
- Jönköping Science Park-systemet i Jönköpings Län
- Kalmar Kalmar Science Park
- Karlshamn NetPort Science Park
- Karlskoga Campus Alfred Nobels Science Park
- Karlskrona Blekinge Business Incubator AB
- Karlskrona TelecomCity
- Karlstad Stiftelsen Inova i Wermland
- Kristianstad Krinova Science Park
- Linköping/Norrköping LEAD
- Linköping Mjärdevi Science Park
- Luleå Aurorum Business Incubator AB
- Luleå Aurorum Science Park
- Lund Ideon Science Park
- Lund Ideon innovation
- Lund Ideon Bioincubator
- Malmö Medeon Science Park
- Malmö Minc
- Norrköping Norrköping Science Park
- Oskarshamn Atrnova Affärsutveckling AB
- Piteå Acusticum
- Piteå Solander Science Park
- Sandviken Sandbacka Park
- Skellefteå BPark AB
- Skövde Gothia Science Park

- Stockholm Karolinska Institutet Science Park
- Stockholm/Kista Kista Science City AB
- Stockholm/Kista STING
- Stockholm SU Innovation
- Sundsvall Åkroken Science Park
- Söderhamn Faxepark
- Trollhättan Innovatum Technology Park
- Umeå Uminova Innovation
- Umeå Umeå Biotech Incubator AB
- Uppsala Uppsala Innovation Centre AB
- Visby Science Park Gotland
- Visby Tillväxt Gotland
- Västerås Västerås Science Park
- Växjö Inkubatorn AB
- Växjö Videum Science Park
- Örebro Inkubera
- Östersund Business Incubator Jämtland

