

Integration of sustainability aspects in innovation processes

A survey as part of the SPIN
project

Uwe Fortkamp

Louise Staffas

B2025-SPIN
January 2012



Part-financed by the European Union
(European Regional Development Fund)



Sustainable Production
through Innovation in SMEs

<p>Organization IVL Swedish Environmental Research Institute Ltd.</p>	<p>Report Summary</p>
<p>Address P.O. Box 21060 SE-100 31 Stockholm</p>	<p>Project title SPIN</p> <p>Project sponsor European Union (partly)</p>
<p>Telephone +46 (0)8-598 563 00</p>	
<p>Author Uwe Fortkamp Louise Staffas</p>	
<p>Title and subtitle of the report Integration of sustainability aspects in innovation processes A survey as part of the SPIN project</p>	
<p>Summary This report is produced as part of the SPIN project. The aim of SPIN is enhancing Sustainable Production through Innovation in and from SMEs. One part of the project has been to collect and assess information on the current status of how sustainability aspects can be integrated into innovation processes, especially in SME. This report provides a short overview of the situation and possible future actions for better integration of sustainability in innovation processes. Additional material can be found in separate documents, a list of tools and a more comprehensive thesis work.</p>	
<p>Keyword Sustainability, innovation process, SME, tools</p>	
<p>Bibliographic data IVL Report B2025</p>	
<p>The report can be ordered via Homepage: www.ivl.se, e-mail: publicationservice@ivl.se, fax+46 (0)8-598 563 90, or via IVL, P.O. Box 21060, SE-100 31 Stockholm Sweden</p>	

Contents

Introduction.....	2
The need for sustainability in innovation processes	2
Framework and situation- a short overview	2
Sustainability.....	2
Innovation and innovation processes.....	3
Pre-requisites for SME.....	4
Ways for better integration of sustainability aspects in innovation processes.....	5
Tool examples for sustainability work.....	6
Further needs.....	7
Background for this report.....	8
References.....	9

Introduction

This report is produced as part of the SPIN project. The aim of SPIN is spelt out in the full title of the project: SPIN aims at enhancing “Sustainable Production through Innovation in SMEs”. The Spin project covers a broad range of activities as support for SMEs. One part of the project has been to collect and assess information on the current status of how sustainability aspects can be integrated into innovation processes, especially in SME. As part of the work, Omer Rana, a student at Linköping University, has done his thesis work on this topic. This report is aimed to give a short overview on the topic and it is partly based on the thesis work.

The need for sustainability in innovation processes

There is a large need for integration of sustainability into the innovation processes in small and medium-sized enterprises (SME). Some key reasons for this are:

- Innovation is expected to be one of the key factors for future success in global competition. In reflection of this, EU has announced the Innovation Union to boost innovations within the Union. SME are supposed to play an important role, as many innovations are generated in SME.
- Sustainability has now been widely accepted as a necessity to ensure the well-being of future generations.
- The current production and consumption pattern is not sustainable, there is a need for new and innovative solutions.
- SME are an important economic factor in the EU. They are by far the majority of companies and they are responsible for a large part of the economic activities.
- SME are also responsible for a relevant part of the environmental and social impact.

Framework and situation- a short overview

Sustainability

The concept of sustainability is often explained referring to the Report of the Brundtland Commission, Our Common Future. The definition of sustainability in that report is quite well known and often cited: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Although sometimes defined differently, the common understanding is that sustainability is built on three pillars: economic, environmental, and social sustainability. As sustainability covers a broad area of different aspects, it is very difficult to make it measurable.

Innovation and innovation processes

The term innovation can be defined in different ways - it may include a specific innovation or the work with creating innovations. Innovations can be incremental or more radical.

There are also different kinds of innovation like:

- Product innovations
- Process innovations
- Organisational innovations
- Business (model) innovations
- Social innovations

There are different ways how innovations can be created and implemented. One possible way, where the innovation is based on research, is shown in Figure 1. Innovations are regarded as crucial to the competitiveness of a company.

Common for many definitions of innovation are

1. The innovation includes a new solution
2. A new idea is only an innovation if it gets to the market

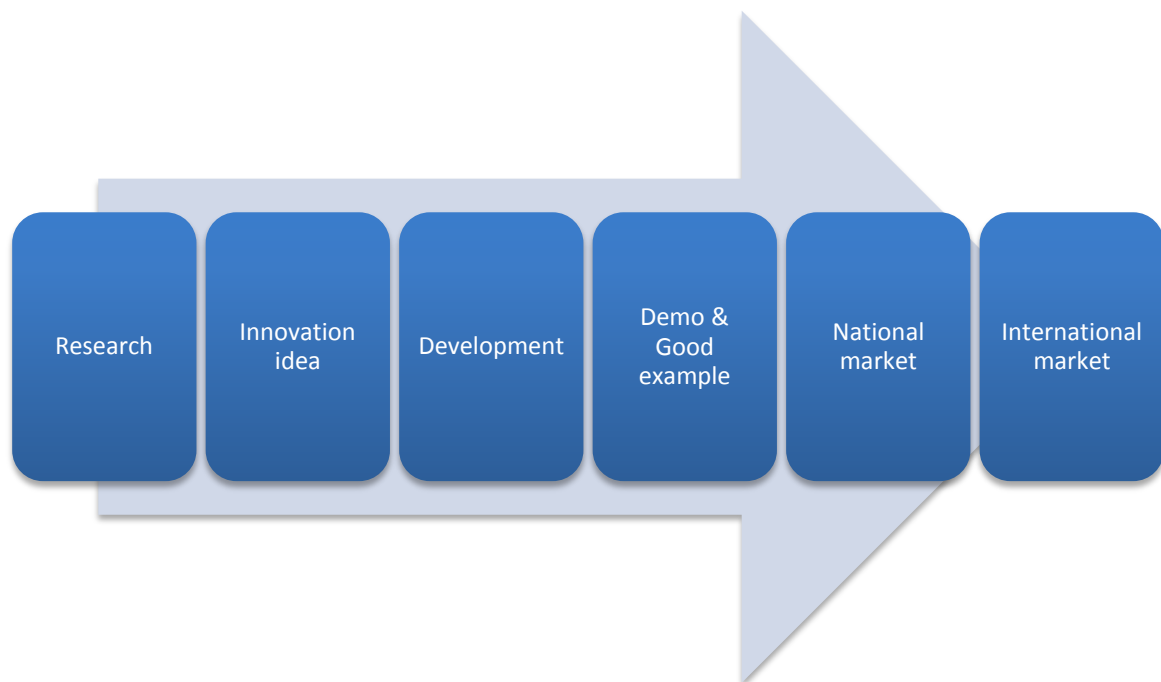


Figure 1: Possible innovation chain based on research work

Innovations can be generated in different ways. They might be created through an entrepreneurs idea, they can be based on an invention or new science knowledge, they might also be a result of improvement work.

Innovation processes are often complex and require a number of different actors, where human engagement is decisive: There is the need for a visionary with a new idea as well as

for an entrepreneur that organises the implementation of the innovation. The innovation process also has to be financed and established on the market (selling). An innovation will have most effect if it is taken up by other companies. Last but not least, there have to be customers that request new products and services.

Sustainable innovation processes often differ from conventional innovation mainly in purpose and direction. Whereas innovation often is intended to improve business performance, stimulate economic growth and company development, sustainable innovation wants to achieve this improvement by the integration of economic (Profit), environmental (Planet) and social (People) concerns. Within the current (economic) framework, it is difficult to fit sustainable innovation and its outcomes as an integration of these three notions.

Pre-requisites for SME

The situation for sustainable innovations for and from SMEs is complex. It is influenced by national, EU and international conditions. Laws, regulations, and permits can trigger sustainable innovations, but they can also constitute an obstacle for SME. Findings from investigations that have been checked for the SPIN project can be summarised as follows.

- 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 available support systems and tools. SMEs have been recognised as important for innovation and some tools are created or adapted to specifically fit the needs of SMEs, which probably will show effect in near future.

As Bouwers states, willingness or motivation can be considered to be most important for a firm’s innovative behaviour. Other important factors are market characteristics, public and shareholder pressures, regulations enforcement and community concerns, customer demands, liability, public image and social responsibility.

Within SMEs, innovation processes are influenced by several characteristics. The main determining factors according to Bouwers are

- sustainability orientation,

- business competences,
- SME characteristics,
- network interface and
- influence of context and market competitiveness.

Internal factors play an important role for implementation of sustainable innovations. An efficient management structure is important, as it provides a better overview on improvement opportunities. The commitment of both management and personnel is important. Skilled personnel are another decisive factor. Many SMEs take small, incremental steps in the direction of corporate sustainability, often targeted at cost reduction measures.

All SME have a network of different actors, which can play a role for sustainable innovations. Often, sustainable innovations are developed together with customers that have a specific demand or with suppliers where often good relations exist that facilitate discussions on product and service improvements. The trade and branch associations usually have sustainability and innovation related activities that support the processes in SME. Also governmental institutions have different mechanisms to support sustainable innovations, although they often might address only parts of it, i.e. focusing on the innovation part or on sustainability or only on environmental innovations.

Ways for better integration of sustainability aspects in innovation processes

Several factors are important to improve the integration of sustainability aspects in innovation processes. Some crucial points are the understanding, motivation, and commitment from management and engaged personnel. This can be achieved by better knowledge about the needs for sustainable innovation and the possible benefits. Such benefits are for example business cases leading to increased sales or improved efficiency leading to higher competitiveness.

Lack of time is one of the main factors influencing SME. Thus, solutions that facilitate the integration of a sustainable innovation process in the current organisation are helpful. Successful companies need to keep and develop their competences. All different actors in the innovation process have to have knowledge and awareness about sustainability as a need and possibility to create more sustainable innovative solutions: the visionary, the entrepreneur, financing actors and sales persons.

Networking is important for most SME, and can also be a support for integration of sustainability in innovation processes. Inspiration and support can be gained both from dialogue with customers or with suppliers, but also within network meetings e.g. in branch organisations.

As support for SME, a large number of tools have been developed that cover different aspects of business processes and innovation. Not all of these tools are applicable to SME and many of them are also more generic for the innovation process, not addressing sustainability. On the other hand, many tools do not address all different aspects of sustainability, but usually are focussing on the economic or environmental dimension. A

non-exhaustive list of tools that have been collected and assessed with regards to their suitability to help SME in their innovation process during the SPIN process is available as supportive document to this report. Information about a number of tools that are suitable for SME is also made available at the SPIN homepage (www.spin-project.eu). The tools take up different main aspects that are needed to support SME in their sustainable innovation process:

- Financing tools that provide financial support to sustainable innovations,
- Competence tools that increase the competence in the company, for example a number of life-cycle tools to assess the impact of new products
- Business and market tools that support e.g. business analysis allow designing more competitive solutions.
- Other tools that are not covered by these categories.

Tool examples for sustainability work

There are a number of tools available to help companies in their planning and execution of LCA, sustainability work, carbon footprint calculations, environmental management etc. Some sites and/or tools are intended specifically for SMEs whereas others are more general but still useful for SMEs. The following tools are examples of such tools and programs. They are chosen to illustrate types of available sites, tools and programs and not because they by any means are considered being better than other tools.

Environment tools, <http://www.environmenttools.co.uk/directory/search>

Environmental tools is a homepage with a large, independent, collection of tools with a possibility to review each of them. It is easy to get a good overview over available tools and if they are suitable for your specific need. The tools are tagged, and it is therefore easy to either search a specific tool by name or search by tags such as land use, bioenergy, transportation etc. You have to register to access the toolkit, but registration is free. Some tools are specifically oriented towards SMEs.

As an example, one of the tools, One Planet Vision,

<http://www.oneplanetvision.org/organisations/one-planet-action-plans/free-toolkit/>

helps out with creating a sustainability plan. The tool is free of charge and includes instructions and templates that can be used for a variety of companies.

EcoSMEs, <http://www.ecosmes.net/cm/index-EP>

The EcoSMEs site is specifically intended for SMEs and has two tools for the innovation process and LCA assessment. Concepts and instruments are explained as well as some guidelines for industry branches where SMEs constitute a significant part of the activity. Registration is needed to access the tools. (Man får ingen information om själva verktyget förrän man registrerat sig så det är svårt att ge mer info än såhär.)

VOC tools, http://www.pius-info.de/en/pius_info_pool/tools/voc-tool/index.html

This tool is free of charge but only available in German. It consists of an excel sheet and focuses on monitoring the use and flow of solvents. Such visualization is a first step towards reducing the use of such solvents according to EU guidelines.

Product development in SMEs,

<http://www.tillvaxtverket.se/huvudmeny/insatserfortillvaxt/flerochvaxandeforetag.4.418280eb12db85acaec80003590.html>

This site lists several supporting programs in various subjects for SMEs in Sweden. The subjects include SMEs in change, support for entrepreneurs, support for women who want to start businesses, young entrepreneurs etc.

The site is in Swedish and also directed towards Swedish companies although some information in English is available.

The site provides a clear overview of available supports for different kinds of branches and types of companies and is therefore a helpful tool in the development of e.g. SMEs.

EuPeco profiler, <http://www.limas-eup.eu/?lang=en>

Supporting eco-inventions for energy using products (EuP). The tool is free of charge and is intended to support eco-innovation in the area of EuP. The tool shows the environmental impact of the process and product and helps identifying the most important aspects to improve.

Further needs

There are different ways for integration of sustainability in innovations processes as described above. The following activities address the needs of SME in order to facilitate such integration in the future:

- SMEs need better help to reduce their lack of time, e.g. by new tools or time saving regulation, i.e. less administration
- There are a number of supporting tools available today for financing as well as competence. Many of these tools can be adapted better to SME needs and there is a need to provide guidance on how to choose tools and increase the accessibility.
- Improve access to internal and external financial support / capital for SMEs, and include sustainability aspects in financing
- 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 support for external competence in specific questions, e.g. a system where small questions can be answered by experts free of charge
 - 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”. The governmental programs should better than today promote sustainable innovations.

Background for this report

This report is produced as part of the SPIN project. The aim of SPIN is spelt out in the full title of the project: SPIN aims at enhancing “Sustainable Production through Innovation in SMEs”.

SPIN is based on the simple but normally successful business equation of matching supply and demand. SPIN taps on innovations throughout the Baltic Sea Region (BSR), which lead to sustainable production in SMEs. It supports SMEs who have developed sustainable solutions to reach out to a larger market. At the same time it gives enterprises the technical and managerial solutions they need to make their production process more sustainable and to increase their profits.

In doing so the project is creating a win-win-win situation: The supplier increases his profit by selling more products / services, the applier increases his profit by reducing production costs (e.g. through improved resource efficiency) and / or by increasing his sales (through innovative production techniques fulfilling higher environmental or social standards).

Society benefits through reduced environmental costs or improved working conditions.

The slogan of SPIN is therefore: Private Profits – Public Benefits.

SPIN has created a number of instruments to fuel this matchmaking throughout the BSR: Innovation highlights like the ones presented in this brochure are collected in the SPIN Database. This is a ready-to-use instrument for SMEs wanting to push their innovative products and for enterprises seeking an innovative solution for their specific situation. All SMEs from the BSR can register and post their entries directly online. The SPIN partners perform a quality check and if the data set is meeting the criteria of sustainable production the entry is made accessible to all users. Users only searching the database for innovations can use it without registering.

Other instruments are the SPIN Toolbox and the SPIN Industry Workshops. The SPIN tools can be applied rather broadly in all kinds of SMEs and are not as specific as the innovation highlights.

The SPIN Industry Workshops bring together experts, enterprises and researchers from different countries of the BSR. The host of the workshop is setting up the agenda of the workshop based on a background analysis on the needs of the SMEs in the specific industry sector of his country.

It’s all about creating a market for innovations – provided that they enhance sustainable production.

While the effective matchmaking between supply and demand involving SMEs from the whole BSR is one pillar of the SPIN project the other important pillar of SPIN is the improvement of the political, macro-economic framework conditions. Based on the results of country specific studies and a synthesis report for the whole BSR, SPIN partners have developed the SPIN Action Plan. The SPIN Action Plan translates the findings on SME needs, existing barriers to innovations for sustainable production and experience on best-practice incentives into a transnational action plan. It addresses policy makers on national, transnational and European level as well as authorities, financing institutions and associations. The aim is to reduce barriers and create new transnational incentives to effectively support an uptake of innovations for sustainable production in SMEs of the BSR.

SPIN ended January 2012 and is supported by the Baltic Sea Region Programme 2007-2013 of the European Union. The website www.spin-project.eu with information and tools is available also after the end of the project. SPIN is led by the Federal Environment Agency from Germany and brings together some of the most important institutions for eco-innovations in the BSR.

Many national governments, sector associations, research bodies and transnational NGOs support the project. The importance of SPIN is further highlighted by the fact that the EU Strategy for the Baltic Sea Region as well as the Council of the Baltic Sea States (CBSS) awarded SPIN the title as Strategic and Lighthouse Project, respectively.

For more information please visit the website, which provides you also with all contact details for every partner country.

References

This report is completed by two other documents:

1. Omer Rana, Tools for implementing sustainability in the innovation process at small and medium-sized enterprises (SME), Master Thesis at Linköping University, 2011
2. Tools for integration of sustainability aspects in innovation processes in SME

A number of relevant references can be found in the Master Thesis by Omer Rana. Further references:

Kungl. Ingenjörsvetenskapsakademien (IVA), Innovations, Entrepreneurship and growth (in Swedish), 2010, ISBN: 978-91-7082-817-1

World Commission on Environment and Development. Report: Development and International Co-operation: Environment . A/42/427. Annex: Our Common future (Brundtland report), 1987, <http://www.un-documents.net/wced-ocf.htm> (jan 2012)

Martin Charker, Tom Clark. Sustainable Innovation, Key Conclusions from Sustainable Innovation Conferences 2003-2006 organised by the Centre for Sustainable Design. The Centre for Sustainable Design, University College for the Creative Arts. 2007

Hilke Bos-Brouwers, Sustainable innovation processes within small and medium-sized enterprises, Vrije Universiteit, 2010, ISBN: 9789086594733

Swedish SMEs view on innovations and R&D-threats and opportunities, in Swedish (Svenska småföretags syn på innovationer och FoU- hinder och möjligheter). SEB, Vinnova. 2007.