



Sustainable Production
through Innovation in SMEs

www.spin-project.eu

Tools for Entrepreneurs in their business



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» Introduction

Entrepreneurs are facing challenges, which are seemingly conflictive: On one hand they are facing increasingly tough competition on globalised markets and need to excel in order to keep their enterprise in business. On the other hand they are obliged to comply with environmental EC regulations and directives (or equivalent national legislation) in order to ensure sustainable development for all of us.

There is support available that helps companies in their innovation and business processes, from the idea for a new product and product development to the market penetration. But it is often difficult, to find the most relevant tool and information among the different sources e.g. on the Internet. Therefore the SPIN project (more about the project at the end of this brochure) has collected a number of tools that are applicable for small and medium sized enterprises (SME). Focus has been on tools that also are able to support more sustainable innovations. This brochure gives a snapshot of the SPIN toolbox by showing some examples taken from the SPIN toolbox database.

SPIN is providing small and medium sized enterprises (SMEs) with a whole set of instruments that put entrepreneurs in a position to innovate their production processes and products leading to improved business and public benefits. Except for the SPIN toolbox with a large number of tools in different categories, other relevant information is available on the SPIN homepage www.spin-project.eu. An example is a database with highlights showing interesting and relevant innovations in different fields.

» The SPIN toolbox

In their business, entrepreneurs in SME have to make many choices and take actions in order to be successful on the market. There are specific needs not only during development of products but also for improvement of the own internal management and production processes. The SPIN toolbox addresses these needs by providing a searchable database. The tools in the database have been selected to be applicable to SME and to cover different sectors and different purposes.

The Spin toolbox addresses a number of areas specifically:

- **Financing:** tools that provide improved access to financing different steps of innovation and product development on a national or EU/international level
- **Business and market:** tools allowing to be better prepared for the market, both market analysis and market penetration
- **Competences:** Skills in the workforce are crucial in many SME. There are tools to improve competences and knowledge within SME as well as to provide external expertise.
- **Other:** Additional tools that do not fall into the categories mentioned above.

The following pages provide a number of examples from the SPIN toolbox database. These and all other tools in the toolbox are available on the SPIN homepage (www.spin-project.eu)

Tools selected for this brochure

Within the area of financing:

EU funding example:
Research for SME

Innovation voucher

Within the area of competences:

Umberto

SCOR Supply Chain Operations Reference Model

Value stream mapping

Emas Easy

» EU funding example: Research for SME

The European Union has a number of funding schemes that are applicable for SME. Some of them help SME in the process of developing innovations and getting them on the market. One example is "Research for the benefit of SME".

The ENABLE project is one example for projects supported within this programme.

Environmentally Acceptable Pretreatment System for Painting Multi Metals (ENABLE)

With increasing demands from customers and public authorities on using environmentally acceptable processes there is a great need for SMEs within the metal surface painting industry to change pre-treatment process. Today's pre-treatment system, zinc phosphating, is a chemical process with high consumption of water and energy and with use of potentially toxic chemicals like nickel and zinc. The need to substitute zinc phosphating is also related to pre-treatment of light weight material e.g. aluminum and magnesium.

The problem that the project addresses is to replace the "standard" pre-treatment process for out-door use, zinc phosphating with a new process. This is the only way to meet the increasing demands from customers and authorities. The magnitude of the problem can be understood by the fact that the process in use has 40 years of experience

■ Tool name:

Research for the benefit of SMEs

■ Category:

Finance, Competence

■ What is achieved with the tool:

The programme helps SME to outsource research, increase their research efforts, extend their networks, better exploit research results and acquire technological know how, bridging the gap between research and innovation.

Contact:

http://cordis.europa.eu/fp7/capacities/research-sme_en.html

and the new processes have a completely different way of protecting the product.

The SME involved in the project will considerably improve their competitive position by being in the lead at replacing zinc phosphating with the new silane/zirconium based processes. That is if the "process for change" will be successful regarding selection, adaption and running the process and if the dissemination will succeed. These issues are dealt with in the ENABLE project.

More to know about the tool

Three groups of indirect actions are gathered by European Commission in 'Research for the benefit of SMEs'. The goal is to strengthen the 'innovation capacity' of small and medium-sized enterprises (SMEs) in Europe and their contribution to the development of new technology based products and markets. The groups of actions are:

1. Supporting SMEs outsourcing research activities

This support aims at SMEs or SME associations in need of outsourcing research to providers of research services ('RTD performers') such as universities, research centres or other, more specialised SMEs.

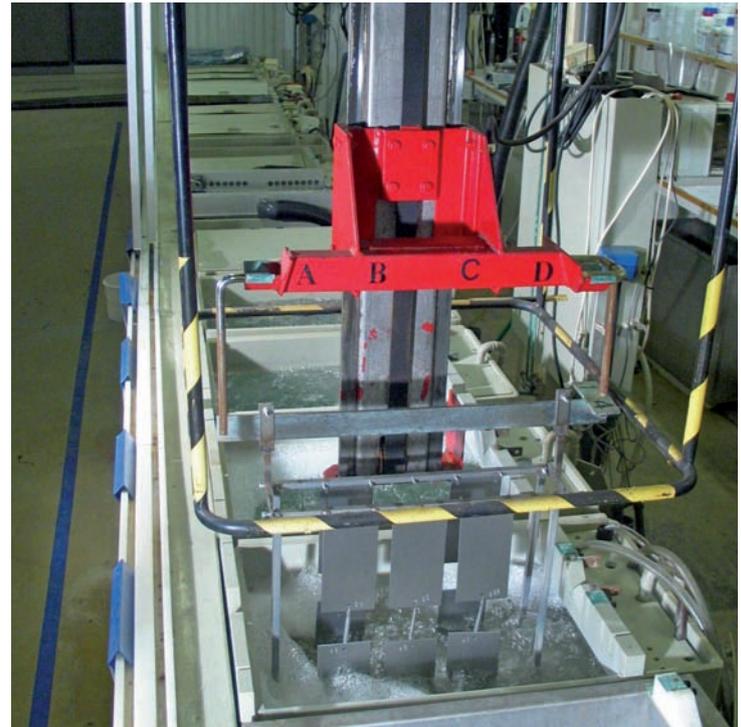
2. Developing and coordinating support to SMEs at national level

In the long-term perspective, it is expected that national and regional research programs for SMEs establish common objectives and evaluation methods for trans-national research cooperation with a significant added value to Community support for the benefits of SMEs.

3. Support measures

In this context, additional measures will be launched to reinforce the impact of participation in SME-specific research projects and to closely monitor and assess participation in both FP6 and FP7.

The funding conditions and pre-requisites are specific and vary with the different programs. More dedicated information is available on the homepage.



» Innovation voucher

Innovation voucher is a type of financial support provided in many Baltic Sea Region countries with an aim to be **"an appetizer for R&D"**. Although national and regional schemes vary, the common purpose is to offer SMEs easy and quick access to external expertise – in the field of R&D, technology, design, IPR or any other issue SME may lack in-house competence.

Application example from Estonia

In Estonia innovation vouchers are offered by Enterprise Estonia for SMEs entered in Estonian Commercial Register to carry out development projects in co-operation with research and development institutions. From February 2009 to September 2011 485 innovation vouchers have been granted, universities being service providers in almost ¾ of the cases. Vouchers have been used to implement a large variety of products and services, but many of the projects focus on sustainable innovations. Application statistics are also a clear indicator of market demand – for example, out of 183 projects that received the innovation voucher during the first eight months of 2011, a total of 42 dealt directly with energy efficiency in construction sector, especially with passive house design.

One example of cooperation in energy efficiency is a company Elysium LLC that elaborates, manufactures, and installs systems that improve the ventilation of apartment buildings, at the same time providing them with heat. Company developed a system named Heatcatcher that heats apartment blocks and water with energy from ventilation ducts. As the first energy saving results were very promising, company

turned to Tallinn University of Technology to further study the system and get help with improving it. Enterprise Estonia funded the cooperation with an innovation voucher of 16 000 EUR and the cooperation had great outcomes.



Heatcatcher system installed on ventilation chimneys on the roof

"Innovation voucher gave us the opportunity to cooperate with Estonian best researchers in this area. We got an overview of knowledge and opportunities available in universities and compare it with where we stand with our R&D. The most important benefit for us is the fact that best experts in Estonia have examined our Heatcatcher system and evaluated its potential. It ensures our customers that the complicated system is indeed profitable to implement – which in turn makes it easier for us to sell the product. Without the innovation voucher we could not have afforded this kind of external expertise yet even though it is crucial in initial stages of product development."

■ Tool name:

Innovation Voucher

■ Categories:

finance, competence

■ What is achieved with the tool:

Increased competitiveness of SMEs through transfer of knowledge and technology, expansion of cooperation with R&D institutions and increase of capability in IPR-related issues.

■ Contact:

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■ Innovation vouchers existing in other countries, e.g.:

Sweden: Regional solutions like e.g. in Västernorrland and Jämtland:
<http://www.almi.se/mitt/Fristaende-artiklar/Ansokan-innovationscheck/>

■ Knowledge coupons in Denmark

<http://www.fi.dk/tilskud/opslag-stoettemuligheder/loebende-ansoegningsfrist/videnkupon>

■ Regional knowledge vouchers in Poland, Wielkopolska region

<http://www.innowacyjna-wielkopolska.pl/Page.aspx?v=3&tse=0&tse=0&aid=527>
http://www.europe-innova.org/c/document_library/get_file?folderId=122731&name=DLFE-6403.pdf

More to know about the tool

The reason for establishing innovation voucher grants all over Europe is that although SMEs have many good and innovative ideas, they often lack competences and capability to turn them into actual products and services. Often only a small funding is enough to solve specific problem company is facing and/or give a kick to longer co-operation with external experts. A variety of innovation voucher schemes can be found in European countries.

Eligible services

The vouchers can be used to buy in research services and technical expertise or to get access to business expertise, in most cases vouchers support co-operation between SMEs and R&D institutions. Vouchers can be designed to support specific sectors, but usually there are no sector limitations. Many schemes favour SMEs that have no previous experience of co-operation with external experts – newcomers in innovation activities.

Service providers

Criteria for possible service providers also differ: many programmes use a list of approved service providers and in only few cases SME can choose the external expert without restrictions. It is more common to include services from public and semi-public providers; co-operation with private experts is not always supported. Most schemes are implemented on a national level (e.g. Denmark, Poland, Austria, Estonia), but some allow also international co-operation. There are also regional innovation vouchers, often related to local university. Some vouchers operate in many countries at the same time – e.g. KIS-PIMS voucher that was available in France, Finland and Austria.

Voucher size

Maximum support amounts vary from 500 EUR (Belgium, Wallonia) to 25 000 EUR (Portugal) and usually relate to self-financing expected from the SME: for larger financing also bigger contribution of up to 50 % from company is expected. However, many voucher schemes do not require any company co-financing. Innovation voucher schemes are often (co-)financed from structural funds.

Application process

A common characteristic is that all innovation vouchers programmes aim to make the application process as easy and quick as possible, there is little paperwork and approval is given within days or a couple of weeks.

Example of Estonian innovation vouchers – services and procedure

Enterprise Estonia offers innovation vouchers are practical, easy to apply for and do not require self-financing. All SMEs registered in Estonian Commercial Register can apply, but entrepreneurs with no previous co-operation experience with R&D institutions are preferred. Therefore for many SMEs participation in innovation funding program is the first contact with professional R&D institutions.

Vouchers (value up to 4000 EUR for single application, up to 16 000 EUR for joint application) are provided for companies to buy in services related to product or service development consultations, design and implementation, (pre)-feasibility studies, conducting patent search and patent applications, utility model or industrial design etc. Service providers are institutions of higher education, the Estonian Patent Office,

the Estonian Patent Library, patent officials and accredited testing laboratories, institutions of professional higher education and competence centres – and equivalent accredited institutions in other European Union countries.

To apply for the innovation voucher, entrepreneur has to:

- State the problem that needs to be solved and choose a competent service provider.
- Compile a project plan (in co-operation with the service provider) and ask the service provider for a price offer.
- Submit the project plan and price offer to Enterprise Estonia together with an application.
- If the application is accepted and voucher granted, carry out the R&D project (duration max 12 months).
- Submit report and relevant documents to Enterprise Estonia.
- In case the report is correct, entrepreneur receives the grant in full amount of occurred costs.

Enterprise Estonia has also developed a system for e-applications where companies registered in the Estonian commercial register can apply online for grants and services. That way the application process is considerably faster and more convenient. All in all, the innovation voucher is **"an appetizer for R&D"** – simple-to-apply-for and easy-to-get tool that often initiates further co-operation. Other European countries also share this experience – although the value of the voucher may be small, the impact on knowledge transfer is far greater.

» VSM – Value Stream Mapping

Value Stream Mapping is one of the tools used in Lean. The tool is used to give a visual overview of how a product or a service flows through a process. Ideally the process mapped should start with a customer order and end with the customer receiving the product or service ordered. Focus is on waste, i.e. when mapping the process, all non-value-adding activities is highlighted. Finally a new map is drawn where the amount of waste is reduced as much as possible.

Using Value stream mapping also helps companies identify waste in the value stream. Waste in a sustainable perspective being excess use of energy (electricity, heating, compressed air), water, materials, packaging, waste, transport and emissions – thereby leading to improved sustainability e.g. less scrap material or reduced transportation of goods.

Application example

In a laboratory testing medical devices (before they were released for production), the staff was always behind schedule; often several days. A VSM was done with the staff, which showed a huge amount of triple testing, i.e. more or less all medical devices were tested three times, and each testing took several hours. The amount of triple testing was a chock to many among the staff, and the reason for doing this was lack of communication plus a misunderstanding of regulatory and legal issues. A study of the laws and regulations in this field showed quickly, that in most cases one test was satisfactory. The result was a reduction of the process time from more than 7 days to 7 hours.

The tool can also be used to show where the responsibility of the individual process steps are placed (or not in place) by mapping the process in a swim lane diagram using for instance the RACI-terminology.

■ Tool name:

VSM
Value Stream Mapping

■ Category:

Production or administration processes

■ What is achieved with the tool:

Highlights waste or lack of responsibility in a process

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The RACI is a tool that can be used for identifying roles and responsibilities during an organizational change process. Often realised in a responsibility assignment matrix with the following roles assigned to the project participants.

Responsible: Those responsible for the performance of the task. There should be exactly one person with this assignment for each task.

Assists: Those who assist completion of the task.

Consulted: Those whose opinions are sought; and with whom there is two-way communication.

Informed: Those who are kept up-to-date on progress; and with whom there is one-way communication.

» SCOR (Supply Chain Operations Reference model)

The Supply Chain Operations Reference model is used to analyze and improve work processes in the supply chain. The results are: more value creating time, more efficiency, cooperation with suppliers, and fewer errors.

SCOR is a reference model, which means that the company can benchmark itself against companies worldwide. SCOR can be used as a business process re-engineering tool, and will be able to give: A clear overview as to what, where and who. The mapping tool can give precise responsibility distribution as well as a good metric and best practice database to compare AS IS and TO BE processes with.

Application Example

In the case of the new company setting up business, delivering reusable bottles for water and soft drinks, the mapping of the company's intention concerning suppliers and markets to support, show a great possibility to reduce both transport, warehouse capacity and non-profit working routines.

During the mapping process, that was carried out, as cooperation between consultant and company managers, important results were produced in a short period of time. The vision of suppliers was changed and this as a result gave approx. 1800 km. less transport between supplier and customer.

■ Tool name:

SCOR
Supply Chain Operations Reference model

■ Category:

Competence

■ What is achieved with the tool:

Mapping the supply chain

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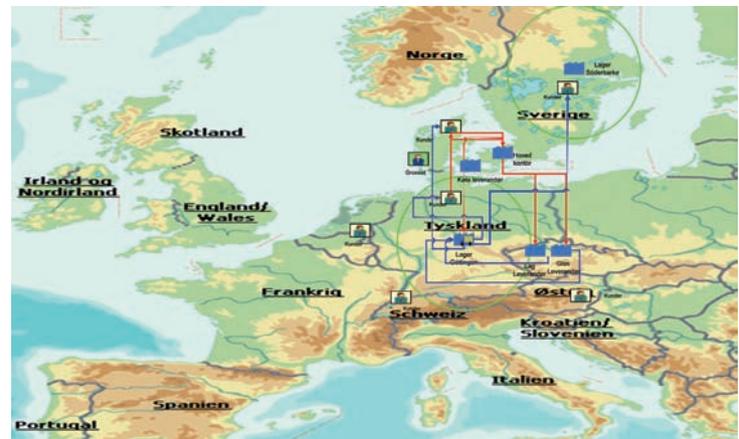
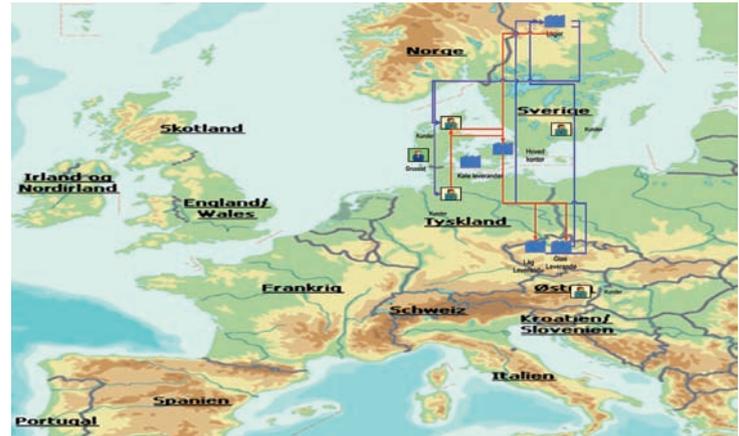
More to know about the tool (applicability, advantages)

The use of SCOR as basis for an improvement process is a very solid platform, giving the possibility to produce overview through mapping, benchmarking on different levels and documentation of changed processes through the supply chain. The SCOR tool is meant to help companies to rapidly and dramatically improve supply chain operations. The SCOR framework is used for evaluating and comparing supply chain activities and their performance. It can be used to describe supply chains that are very simple or very complex using a common set of definitions and enabling a common understanding.

The SCOR model gives people working with improvement a number of mapping opportunities, on distinct defined levels and with distinct defined borders.

The SCOR framework is giving overview of the company's supply chain, so that processes can be made more efficient and visualize the challenges that needs to be changes in order to optimize the whole supply chain.

With the SCOR having been applied by companies (700 in numbers), the best practice, as well as the definitions, seems good, when changing a business to be more sustainable.



» Umberto®

The software tool provided by ifu Hamburg, Germany, is a powerful instrument to calculate, visualize and evaluate material and energy flows as well as consumption of resources of individual production processes or even single machines. A supporting tool, Umberto® for Carbon Footprint is also suitable for calculating product carbon footprints.

The tool provides well-arranged flow diagrams which reveal material and energy flows in a production process. Given input-output relations of processes are calculated from specific entry parameters. After each calculation the user can view and evaluate the results which can also be shown and processed as input-output balances. The calculated balances can be evaluated in many ways, e.g. using economic and environmental performance indicators. With Umberto® it is also possible to compare two or more balance sheets. All balance sheet results or parts of results can be displayed as diagrams and exported to excel.

The tool is composed of different modules which, besides calculation and evaluation functions, comprises Life Cycle Assessment, process libraries with data sets of particular industry processes, cost calculation schemes, etc. The price ranges from 500 EUR for single modules applied in research and educational purposes up to 11,000 EUR for the complete package with unlimited license. ifu Hamburg offers customised versions of the tool directly responding to individual company needs.

■ Tool name:

Umberto

■ Category:

Competence

■ What is achieved with the tool:

Visualisation of material and energy flows in individual production processes.

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Application examples

Many well-known companies such as BASF, Henkel, Procter and Gamble already apply Umberto® for production planning, optimisation of complex production systems, life cycle assessment calculations and overall improvement of environmental protection. Also research institutions such as Öko-Institut, Freiburg, Germany, are elaborating life cycle assessment analysis by using Umberto®.

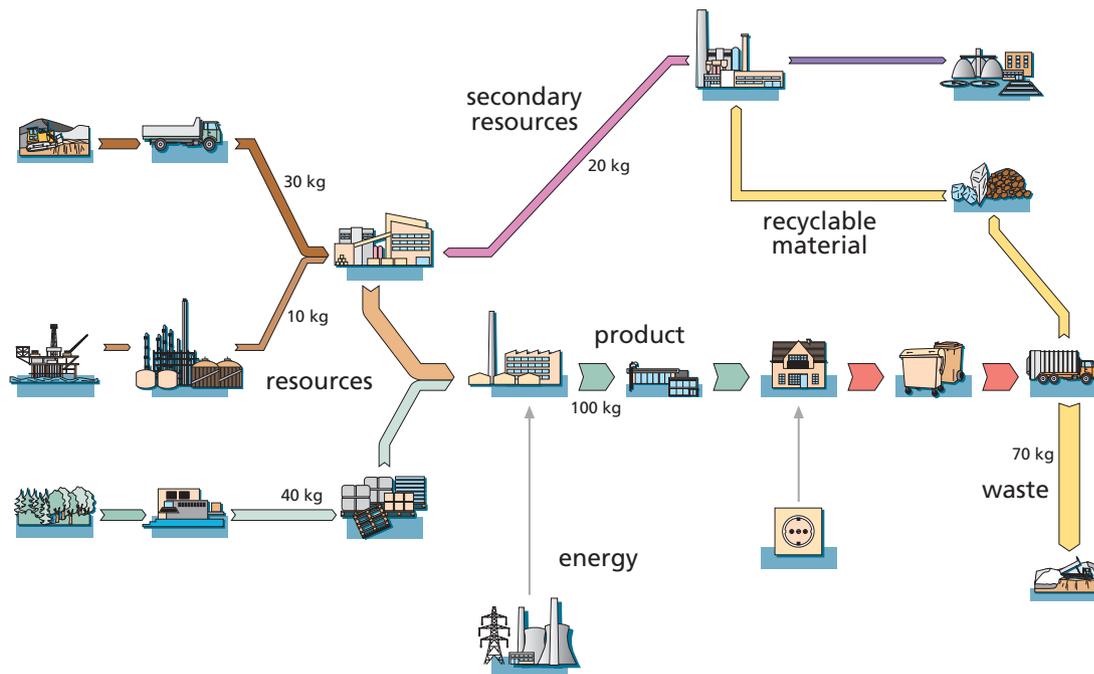


Figure: Modelling and visualization of a pigment production (titanium dioxide).

Mohn Media, a printing industry company, shifted its monitoring and elaboration of balances to Umberto® software in order to reduce complexity in its balances and to create improvements in process optimization and clearness regarding all relevant environmental data. All material and energy flows, divided into raw and operating materials, energy forms such as electricity, heat, cooling energy and fuels (e.g. natural gas). Also material (printing products, wastes and emissions) which leaves the company premises are included. In total, about 6,000 material groups are monitored and 100,000 movement data are processed with Umberto®, the latter allowing set up of the company's

environmental balance which serves as basis for resource and environmental protection.

More to know about the tool

A free web demo version as well as a demonstration video of Umberto® is available on the website (<http://www.umberto.de/en/>). ifu Hamburg also offers training courses every two months in Hamburg and Munich and provides consulting service addressing operational resource efficiency, process modelling, carbon footprinting and life cycle assessment.

EMAS easy is a new approach based on Ecomapping. It was developed to help SME's to process an environmental management system (EMS) grounded on their baseline assessment.

EMAS easy is a way to implement an Environmental Management System which is proportional to the size, financial capacity and organizational culture of small business. It assists, using a number of new features, with compliance with the environmental standards ISO 14001 and EMAS but still focusing on what matters – environmental protection on the shop floor.

EMAS easy is delivering Environmental Management System in ten days, with ten people, on ten pages. The work process from, Start to End, takes 30 steps.

Go to www.emas-easy.eu and download the brochure, describing how to use EMAS easy (The brochure is in 20 languages).

The EMAS easy is a management tool for both manufacturing and service organisations for evaluating, improving and reporting their environmental performance.

4 steps to registration:

1. Conduct an environmental review considering all environmental aspects of the organisation's activities, products and services; methods to assess these; its legal and regulatory framework and existing environmental management practices and procedures.
2. Establish responsibilities within the EMS; set objectives; provide the resources to support the EMS; implement operational procedures appropriate to the objectives; identify training needs and implement monitoring and communications systems.
3. Carry out an environmental audit, assessing in particular the management system and conformity with the organisation's policy and programme as well as compliance with relevant environmental regulatory requirements.
4. Publish a statement of its environmental performance that lays down the results achieved against the environmental objectives and future steps to be taken to continuously improve the organisation's environmental performance.

The EMAS easy brochure will walk you through each step on the way to EMAS in an easy way.

"EMAS easy Ecomapping is a step by step process to gather useful information and to immediately trigger environmental action. As 80 % of environmental information is location-based, Ecomaps of your shop floor are useful. They point to inadequate behaviour, problems with equipment, workflow arrangement and lead to the identification of environmental impacts."

Description of a practical case with a company, incl. picture.

More to know about the tool (applicability, advantages)

Establish your environmental programme: who does what, when, how, with what means and by which dates?

An environmental management programme is a set of environmental objectives and targets designed to improve the environmental performance of the organisation. It is an overall work plan that translates the company's environmental policy into everyday practice. The programme designates the responsibilities and the means to achieve the defined objectives and targets and to meet the deadlines. The programme is used to integrate environmental protection into the daily life and must lead to changes in behaviour and environmental performance. It is the driver for continuous improvement.

One drop of water takes from five to 25 years to go from a cloud to your tap. Water is a resource which must be protected and must not be wasted. One person consumes on average 120 litres of water a day. How much does your company consume per year in comparison with a normal person?

Which areas of activities are dangerous in terms of water pollution, e.g. cabin for painting or paint stripping?

Check to see where all drains are situated. Don't forget that one drop of petrol product contaminates more than 5,000 litres of water.

■ Tool name:

EMAS easy

■ Category:

Competence

■ What is achieved with the tool:

Get overview of company environmental performance and start develop you environmental management system.

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Light procedures, corrective action for ISO 14001 and EMAS = the step stones

- Initial review
- Monitoring Performance Indicators
- Environmental programme
- Communication Internal audits

EMAS easy

DANISH TECHNOLOGICAL INSTITUTE

spin
Sustainable Production through Innovation in SMEs

» About the SPIN project: www.spin-project.eu

The aim of SPIN is spelt out in the full title of the project: SPIN aims at enhancing "Sustainable Production through Innovation in SMEs".

Our understanding of innovation is based on the definition of the former Finnish Prime Minister Esko Aho who stated: "Quite often, when people talk about innovation they mean research and development. But innovation is broader than that: research is transforming money into knowledge, **while innovation is transforming knowledge into money and well-being.**"

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). In any case 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. "Umberto" is such a tool that is promoted by SPIN. It is a powerful software tool to model, calculate and visualize material and energy flow systems in SMEs with cost intensive production that wish to optimize their processes and improve their competitiveness. Results can be assessed using economic and environmental performance indicators.

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 is supported by the Baltic Sea Region Programme 2007-2013 of the European Union. The project is lead 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.

The website www.spin-project.eu has developed into a frequently used information platform for entrepreneurs and policy makers in the BSR but also into a market place for innovations and tools supporting sustainable production.

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

SPIN national contact points:

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