

# TOSCA

How companies work to realize sustainability goals



CHALMERS





# What it's all about

Project TOSCA is a project on Life Cycle Management aiming to show how companies can work towards sustainability. TOSCA addresses the total value chain of a product, from extraction of resources to end of life. Sustainability is a broad term and in order to work effectively measurable goals are needed. TOSCA shows how the work towards sustainability must include working with suppliers, contractors, carriers, customers as well as a company's own organization and production units. Many tools and methods for measuring environmental performance exist today. In order to minimize redundant work and make the follow-up effective, cooperation is needed.

For a company that works actively with sustainability TOSCA presents useful methods for employees in all functions including management. It also delivers a "learning-kit" for a wider audience. An extensive TOSCA website has been developed to spread the ideas and findings and the "hands-on" sections reflect essentially the ways of working in the participating companies; SCA and AkzoNobel.

During the project period, the companies have actively involved many suppliers and partners and the importance of cooperation and communication (when it comes to improving the sustainability performance of a company) must be highlighted. The work towards sustainability needs to be integrated into the daily work and it is a long process built-up of many small steps. Quantifying environmental performance is a task that can be done on many different levels; e.g. emission of greenhouse gases can be calculated for the whole company or for an individual product. A couple of methods; Carbon Footprint and Eco-efficiency are used as examples from SCA and AkzoNobel's own reporting.

To sum up, working with sustainability is a combination of persistent day-by-day work of continuous improvements as well as a work on creating awareness all along the value chain. There has been a lot of talking about sustainability over the years, which has resulted in a higher awareness and the creation of a common language and common definitions. This is a necessary step on the way and the next step is to transform this awareness into action in companies and organizations.

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# Introducing sustainability

During the last twenty years sustainability has become a word that you hear more and more frequently. The society and the surrounding world need to be more sustainable to be able to overcome the challenges of today and create a common future on this planet. The challenges are numerous, like mitigating climate change and handling of resources, but solutions to this will in turn create a wide variety of opportunities for business. A commonly used definition of sustainable development was stated in the Brundtland report “Our common future” from 1987. Here sustainable development is defined as a development that meets the needs of the present without compromising the ability of future generations to meet their needs.

In order to act on this big issue, people and institutions from all sectors in society address the need for changes. The task is complex, but nevertheless sustainability goals and strategies are presented on all levels; international, national and local levels.

Politicians and leaders are counting on companies to make major contributions when it comes to realizing the goals in practice. This is where EU Life+ comes in, providing means for European companies to be better prepared and act on future challenges such as legislation and market opportunities in the envisioned sustainable society.

## Objectives of TOSCA

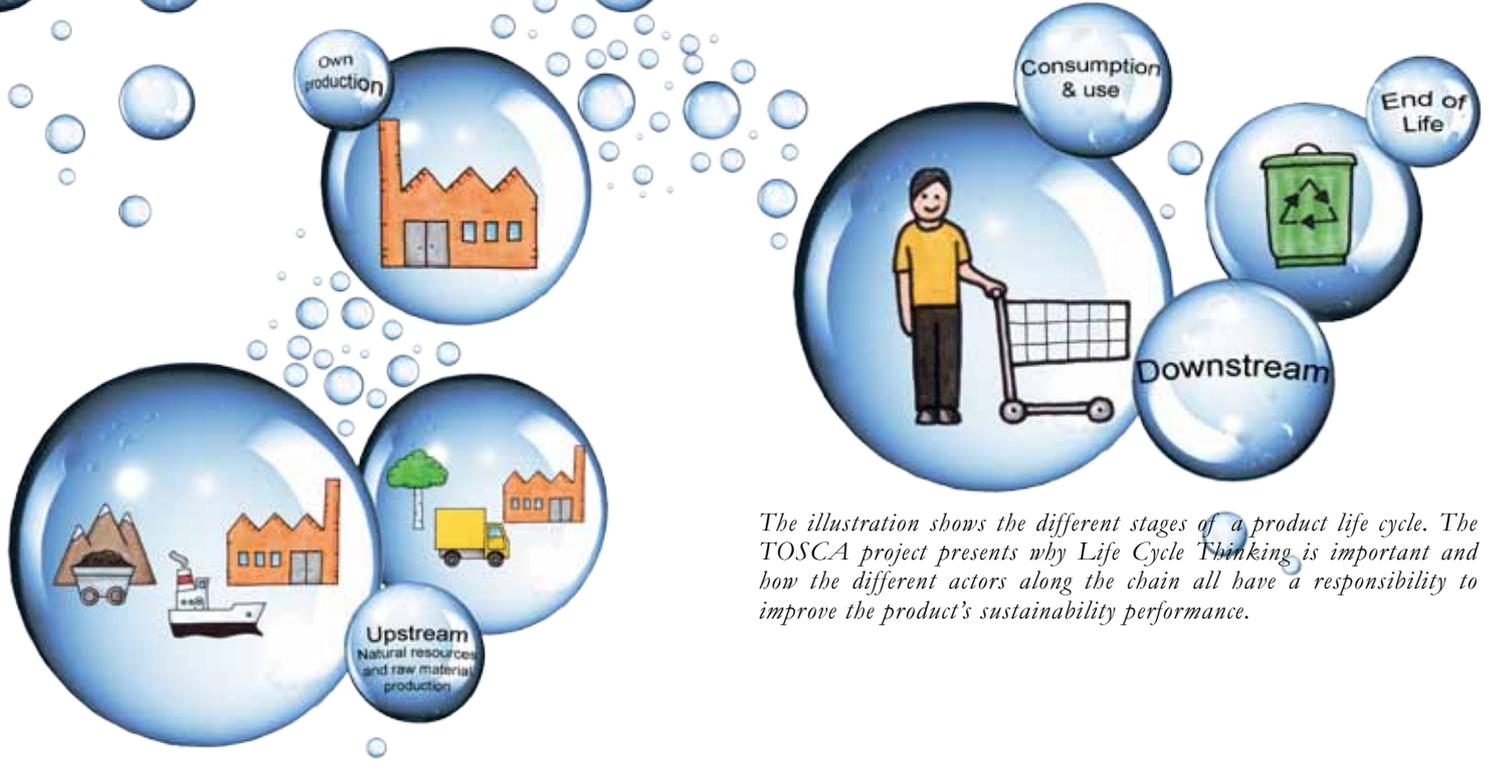
The primary objective of this demonstration project has been to present a structured way of working for companies aiming to work towards sustainable development; How do we make things happen? Which steps are necessary and who should be involved? How can the work be structured and integrated into company strategies and daily routines, including cooperation and communication with suppliers, customers and consumers?

A second objective has been to test and implement the way of working within the participating companies, AkzoNobel and SCA, as well as with the companies’ suppliers. By doing this, many people along SCA’s and AkzoNobel’s respective value chains have been involved in seminars and

workshops. The objective was to work cross functionally in the companies during this implementation and to test new working processes.

A third objective was to create a public web site serving as an information platform and educational tool, giving background and advice for the different issues. There is e.g. a section on how to start the work with LCA, Eco-efficiency or Carbon Footprint with “Getting started guides”.

A web forum, serving as an interactive tool, has been created where different questions and topics can be addressed. This forum was also part of the project objective.



*The illustration shows the different stages of a product life cycle. The TOSCA project presents why Life Cycle Thinking is important and how the different actors along the chain all have a responsibility to improve the product's sustainability performance.*

## Basics on Sustainability management

All parts of a product's value chain have an impact on the sustainability of a company's products. This includes the extraction of resources needed, the production of raw materials, the manufacturing, the transportation, the use and end of life of the product.

When considering the sustainability aspects of a product; the environmental, social and economic costs and benefits associated with a product, one must consider not only the direct *manufacturing* of the product but also all the *upstream* production at suppliers of raw materials and components needed for the product as well as *downstream* uses by customers and eventual waste management.

### Value chains

Actors along the chain are responsible for improving the sustainability performance. This approach is the basis for the framework and processes that has been developed in the project and means that TOSCA works with a life cycle perspective. To work with this view and to strive to integrate product sustainability into the daily activities, is also known as Life Cycle Management (LCM). It is a growing concept and a term used by businesses when they organize, analyse and manage activities aiming for sustainability.

### LCA & Carbon Footprint

A number of methods and tools are developed to aid the assessment of a products sustainability performance. In Life Cycle Assessment (LCA) all natural resources and all emissions released into nature during a product life cycle are accounted for. Also, a range of environmental effects of these resource uptakes and emissions released are estimated. This way an LCA gives a good overall review of a products environmental impact.

A Carbon Footprint (CF) is an account of the net emissions of greenhouse gases, such as CO<sub>2</sub> and methane, were focus is on a single environmental factor, i.e. climate change.

### Eco-efficiency

Eco-efficiency is another method where a full LCA is done on a product life cycle but the economic value of the product is also taken into account. For example if two products have the same environmental impact but the first product has a higher value than the second, then the first product is considered to be more Eco-efficient. Or, if two products have the same value but the first product has higher environmental impact then the second product is more Eco-efficient.

Working practices

# SCA Hygiene Products

The environmental work at SCA is based on life cycle management. A product's life cycle shows how the environmental impact of the company is a combination of several factors; sourcing of raw materials, product developments, production conditions and waste handling. SCA addresses all these factors in the sustainability work.

SCA has a long history of working with Life Cycle Assessment. During the TOSCA project, focus laid on the sourcing process of raw materials. What's the role of sourcing? How can roles and responsibilities between different functions in a company be defined and organized in order to work efficiently towards sustainability goals?

Focusing on the sourcing process leads to a closer cooperation with the suppliers, which is also a consequence of the active sourcing approach. It means that when SCA is working with its suppliers on sustainability, the company not only seeks materials that are high quality, safe and environmentally sound, but also look for a suppliers commitment to continuously improve the environmental performance of its production. The reason for the focus on raw materials is logic; the major part of the environmental impact from the personal hygiene

products comes from the raw materials. With the life cycle approach, this also means that also the company's suppliers are very important for decreasing the product's environmental impact.

## Improved working procedures

In practice, the TOSCA work has consisted of defining and establishing ways of working internally in the company as well as with the suppliers. Systems and tools for carrying out the work have been developed and improved, being it systems for environmental data handling and compilation, communication routines or evaluation procedures. An environmental data handling expert was



employed to carry out this work. The obvious goal has been to improve the environmental performance for the raw material suppliers of SCA. During the TOSCA project, a large number of suppliers have been actively involved in the work and the focus has been on the use of resources and contribution to climate change.

## Global Supplier Standard

The company has well defined expectations and requirements that suppliers must fulfil. The SCA Global Supplier Standard is an important document in the communication with the suppliers. The document covers the requirements SCA puts on its suppliers in the areas; quality, product safety, environment, chemicals and code of conduct. The suppliers are expected to sign a letter of compliance with the standard. The goal is to have all suppliers sign this letter by 2013.

The environmental requirements in the Global Supplier Standard has evolved over time. They

have been stated in the standard since many years, but it's really during the TOSCA project that SCA has actively, and more systematically, used the standard to address the requirements.

## Experiences and reflections

Early on an evaluation of the present way of working was done. What worked well and what methods need to be improved?

The TOSCA project has delivered new ways of working and better tools, such as improved environmental data questionnaires, more efficient ways of handling data, evaluation methods and communication procedures.

When roles and responsibilities in the company are well defined, the internal as well as the external dialogue is improved. Implementation of new working procedures need focus and true commitment from the organization.



*Contracts between suppliers and customers are not only about prices and purchasing conditions, it's also about commitments to defined standards.*



# Working practices AkzoNobel

AkzoNobel has increased the efforts on implementing sustainability in operations and strategies extensively during the last seven years. During the years 2002-2005 the company managed the EU founded project DAN TES ([www.dantes.info](http://www.dantes.info)) and an important result from this project was that sustainability was put on the corporate agenda.

## Eco-efficiency

Shortly after the DAN TES project ended, the organization adopted the concept of Eco-efficiency, a concept that combines financial and environmental performance of products. Eco-efficiency was considered to better suit business than a regular Life Cycle Assessment. Implementation of Eco-efficiency started in 2007 and the first step was the investment decisions. From 2008 it has been mandatory to include an Eco-efficiency assessment in an investment proposal exceeding 5 M€. This is done in order to include strategic sustainability aspects in the investment decisions.

Implementing Eco-efficiency in research and development (R&D) was more complicated, since there were different structures for the R&D work in different business units. The Eco-premium solutions concept was born in order to include sustainability aspects in the R&D work when developing more sustainable products. Eco-premium

solutions are products with improved performance in areas such as raw material use, manufacturing processes etc.

## AkzoNobel Carbon policy

When TOSCA started AkzoNobel formulated a Carbon Policy and developed a method for calculating carbon footprint of its' products and facilities. These calculations are done with input data from the value chains and they are based on the standards of the international Greenhouse Gas Protocol. AkzoNobel was one of the companies who developed the standard for SCOPE3 in the Greenhouse Gas Protocol.

From previous studies it was known that the major part of the carbon emissions from AkzoNobels' products does not come from the company's own production processes, but originates from upstream and downstream processes. The products were divided in key value chains for which the carbon footprints were calculated. In the annual report of 2009, the amount of greenhouse gas emissions from all products from cradle to gate presented both as total emissions and per ton of product.

The cradle-to-gate perspective covers stages from extraction of raw materials to where the products leave the company gates. The value chain thinking



# Eco-premium solutions are products with improved performance in areas like raw material use and manufacturing.



has emphasized the need for co-operation along the value chain; not only to be able to calculate the footprint of a product but also in order to improve its environmental performance.

## Supportive Supplier Visits

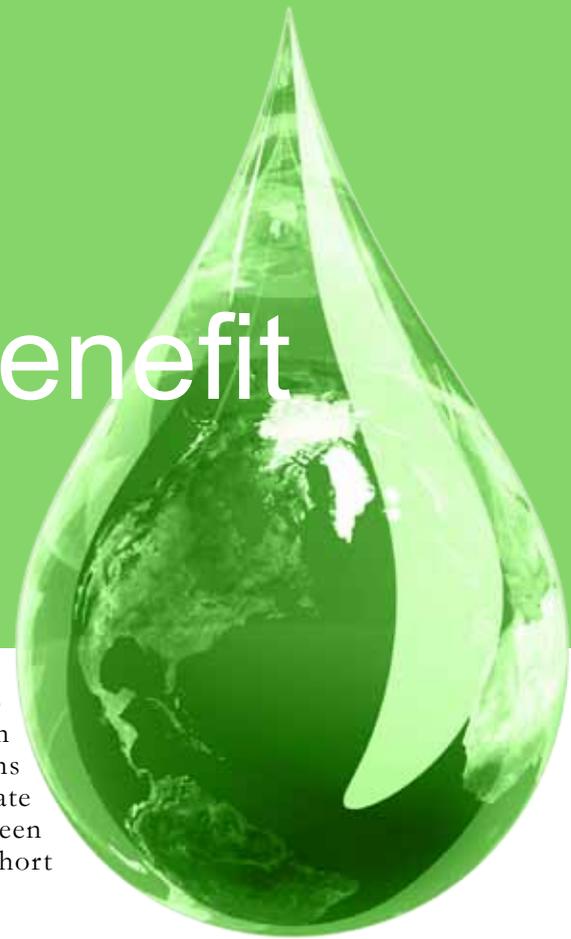
As a result of the new methods, the environmental aspects are now included in the Supportive Supplier Visits, which is a program of on-site visits to critical suppliers in developing countries. The objective of these visits is to identify and care for these critical suppliers as sustainable business partners. A comprehensive Vendor Checklist is used to find strengths and weaknesses in all sustainability areas. Through a feed-back report and follow-up visit AkzoNobel works together with suppliers on improving sustainability.

## Key Supplier Management

In the Key Supplier Management Program AkzoNobel cooperates actively with suppliers to enhance Eco-premium Solutions for customers. The suppliers are asked to deliver sustainable innovations where they are needed. To open up for this cooperation with the supplier, future needs are clearly communicated in this program.

Just as the TOSCA project is ending AkzoNobel is also including the impact that the company's products have after they leave the factory gates – when they are consumed. As a first step this downstream stage of a product is included in the carbon reporting and it is presented in the Annual reporting of 2011. The next step will be to also set goals on improvement on this full cradle to grave perspective.

# Environmental benefit of the project



Processes for producing goods or services will inevitably lead to impacts on the environment. It can be local emissions that have an impact on a nearby land area, a river or a lake, or it can be emissions such as greenhouse gases having a negative impact on global climate change regardless of where the emissions occur. The effects can be seen immediately or after many years, and the effects can cause both short term and long term damages.

Within the TOSCA project, the focus on environmental impacts has been on the consumption of resources as well as the contribution to climate change. Both AkzoNobel and SCA have defined and calculated baselines (reference values) of the respective companies' environmental performance. This is necessary in order to quantify improvements. A baseline can be calculated on different levels; on a product level as well as on a company level. It can be compared to economic bookkeeping; you can calculate the profit for a single product as well as you can sum-up the outcome for the whole company. Before a company can evaluate the results of any specific effort there must be some targets and a baseline for reference. A sustainability strategy should preferably be accompanied by one or several targets. In order to set targets it is necessary to have a good overview on the whole product life cycle and what part of this life cycle that has the largest environmental impact.

In addition to the quantitative reported improvements below, the spreading of knowledge and created awareness should also be considered as an environmental benefit of the project. In the text about Chalmers, high numbers of students have been, or will be, reached by the results from TOSCA in the coming years.

## Chalmers

The sustainability performance of a product is determined by the combined decisions and actions taken by all actors along its life cycle. This includes decisions about design, choice of materials, production method, packaging, transport, energy use, waste treatment. At Chalmers University of Technology, sustainability is a mandatory high priority subject for all students. A key to success is that these students understand how they, in their future professional roles, can improve environmental and social impacts. The implementations of sustainable working practices at AkzoNobel and SCA presented through TOSCA serves as real world examples and they are now used in the education of students at masters level in areas such as civil engineering, technical design and industrial economy.

Expert understanding of the complex web of nature, technology, and society is required to properly assess sustainability performance. Courses on sustainability assessment of socio-technical systems are given at Chalmers to students who seek an in-depth competence profile. However, TOSCA also shows how sustainability can be integrated into normal business functions without necessarily requiring expert knowledge.

# AkzoNobel

For AkzoNobel, a major task in the project TOSCA has been to decrease greenhouse gas emissions. The company target is set to reduce the emissions (from cradle-to-gate) by 10% per ton of product by 2015, using 2009 as reference. The aim is a reduction of 20-25% by 2020.

Studies of the Carbon Footprint for the company's products have shown that 70% of the emissions come from the raw materials upstream, 20% from purchased steam and electricity and 10% from AkzoNobel's own production. In addition to these emissions, the usage and waste phases of the products downstream contributes with emissions of approximately the same magnitude.

The TOSCA project team has been deeply involved in setting up processes and projects around the carbon policy and renewable raw materials. To work towards the set targets all ten business units have written carbon management plans where improvement activities are identified and quantified. These plans are updated on a yearly basis. The actual emissions are followed up yearly and published in the annual report. The result of 2011 shows a decrease of about 1% compared to 2009. One should be aware that identified improvements often take time to realize since they often involve change in the production routes or raw materials.

Another environmental benefit is due to the decision to include sustainability aspects in investments. As a result some investment proposals have been turned down and in some cases new alternatives, better from a sustainability perspective, have been suggested and approved for investment.

# SCA

The first target in SCA's sustainability strategy is to reduce the emissions of CO<sub>2</sub> from fossil fuel and purchase of electricity and heating by 20% by the year 2020, compared to 2005. This goal is published together with three other sustainability goals in the company's annual Sustainability Report. The CO<sub>2</sub> emissions, in relation to the produced product volume from SCA's own production sites, are reduced by 4,2 % between 2005-2010. One important contributor to the reduction is a common energy saving program, E-SAVE, consisting of many small energy saving projects (>1000 since start in 2003) at the sites.

On a product level, the carbon footprint has been calculated for personal hygiene products in Europe and a baseline for products was established in 2008. Yearly updates have been calculated and the assortment on personal care products shows a reduction in carbon footprint by 7-18% for the period 2008 to 2011. This reduction has been achieved as a result of several independent factors; environmental improvements at suppliers and transporters, improvements in own factories and smart product design that leads to less material consumption.

**The following reductions (%) in carbon footprint of the personal care products has been achieved between the years 2008 and 2010:**

Product examples	%
TENA* Flex	7
TENA Lady	17
Libero** open diaper	16
Libero Pants	8
Feminine thin towel	18
Feminine panty liner	7
* TENA is the SCA brand name for adult incontinence products (Flex and Lady are different representatives from the TENA assortment)	
** Libero is the SCA brand name for baby diapers	



## Web page and forum

Since TOSCA is a EU-Life demonstration project, an important part is to spread information on how the participating companies work with sustainability. For this purpose the TOSCA sustainability framework website has been launched:

[www.tosca-life.info](http://www.tosca-life.info)

The TOSCA sustainability framework website is an information platform for companies and organizations interested in learning how to implement sustainable development, within the company and in the value chains. The information at the website is divided into three main parts:

**Activities for sustainable supply chains** describes activities for working with sustainability in different parts of the supply chain. They cover the whole life cycle perspective; from upstream supply chain and suppliers, own manufacturing through use and end-of-life. This part includes practical examples from SCA and AkzoNobel as well as State of the Art descriptions and such:

**Sustainable development** includes a general introduction to the topic. This part describes the history of sustainable development, current trends and issues, as well as the implications of sustainable development for business.

**Getting started guides** contains practical guides for how to get started with selected central tools for measuring and analysing sustainability aspects in supply chains. For example, guides are available for Life Cycle Assessment (LCA) and Eco-efficiency Assessment (EEA).

A forum on Life Cycle Management has been developed as a complement to the TOSCA website:

[www.lifecyclecenter.se/forum](http://www.lifecyclecenter.se/forum)

At the forum anyone can ask questions related to the area of Life Cycle Management and share their ideas, knowledge and experiences with others. Topics discussed in the forum can be linked from the TOSCA website and vice versa.

# About TOSCA

is an acronym: Towards sustainable value chains through a common approach for company strategic work and daily operation. This TOSCA project was co-financed by the EU's Life+ financial instruments. LIFE07 ENV SE 000912-TOSCA

**AkzoNobel** has had about ten people actively working in the project and more than 40 people from different parts of the company have in other ways been involved in the subject of TOSCA. AkzoNobel is the largest global paint and coatings company and a major producer of specialty chemicals. Their portfolio includes well known brands such as Dulux, Sikken, International and Eka.

**SCA** has had more than 30 people from different parts of the company (Sourcing, Environment and Product safety and Research & Development) involved in the TOSCA project. SCA is a global hygiene and paper company that develops and produces personal-care products, tissue, packaging solutions, publication papers and solid-wood products. The company has many famous brands such as TENA, Tork, Libero and Libresse.

**Chalmers** is a technical university situated in Gothenburg, Sweden. The university has two campuses, 17 departments, 200 research groups and 10 000 students.

## Transferability to others

The presented activities are, essentially, descriptions of how AkzoNobel and SCA are managing sustainability in different parts of their respective company. The processes and methods can be transferred to any producing company. The life cycle perspective is the basis for working practices and communication routines with suppliers and customers. To work towards sustainability, in practice, is a systematic work consisting of carefully planned day-by-day routines. The website presents a lot of information around how these routines can be set up and managed. Life Cycle Management is a business approach that can be used by all types of businesses (and other organizations) in order to improve the sustainability performance.

## After Life+

The project is finalized, and the obvious question is: *What will happen with the results?*

New ways of working have been implemented in the participating companies. Improved tools and systems are now being used and this way new actors along the value chains will be reached by the results also after the TOSCA project has come to an end.

The web page and forum described earlier will be maintained by the Swedish Life Cycle Center (CPM), a Swedish centre of excellence for the advance of life cycle thinking in industry and other parts of society. The centre is a cross-sector collaboration characterized by close interaction

between *academy, industry* and *authorities*. The three partners of TOSCA are all members of CPM.

CPM was ranked no. 1 in Europe in a recent study funded by the European Commission (2011). The study aimed at identifying key models of public-private partnership, and 18 Eco-design centres in



Europe were evaluated with regard to e.g. training, research projects and opportunities to detect new high value projects. [www.lifecyclecenter.se](http://www.lifecyclecenter.se)