



DANTES

DEMONSTRATE AND ASSESS NEW TOOLS
FOR ENVIRONMENTAL SUSTAINABILITY

DANTES

- a project on business
related environmental work



CHALMERS



Introduction

Daily, decisions of different kinds and at different levels are made in companies. It can be small decisions regarding purchase of office equipment, improvements of a certain product or how to distribute goods. It can also be more strategic decisions, such as where the next production site will be situated or formulation of long-term business goals. In order to make sound business decisions, it is important to consider many different types of aspects. Quality, economy, technical performance are three aspects that have long been taken into consideration. Environmental aspects are also taken into consideration more and more frequently today. Environmental aspects include e.g. emissions to air, water and soil, energy and raw material consumption, working environment and transportations.



Environmental concern within companies is a relatively new term and the concerns are changing over time. In the 70's, environmental concerns focused on local emissions from for example chimneys or water outlets.

Since the end of the 20th century, many companies strive for achieving a good balance between environmental care, good conditions for the employees, benefits to the societies in which they operate as well as profit. Some companies are still inexperienced in environmental business concerns, but others have a long record of working with environmental issues and have clear goals for their environmental work.



The environmental goals can for example be to reduce waste and energy consumption. It can also be to reduce the need of transportation or to communicate the environmental work to customers in a comprehensive way. In order to supply the decision-makers within a company with the correct information and to fulfill the environmental goals, a structured environmental work is necessary. Environmental work can for example include having an environmental management system, to put environmental demands on suppliers and customers or to have an annual environmental report.

There are numerous tools and methods for environmental assessment and many of them are frequently used in environmental work within companies. A tool or a method can for example be a structured routine for compiling data or a software for calculations of environmental impact. Many tools are designed to answer a specific question, such as what is the total environmental impact of a product during its life cycle. Often, different tools need to be combined, but to combine tools and especially to weight the results from them can be a complicated matter.

About DANTES¹

Akzo Nobel Surface Chemistry AB, ABB, Stora Enso and Chalmers University of Technology have different experiences from environmental work and of using environmental tools. They have conducted the DANTES project in order to improve the internal environmental work within the companies, exchange knowledge and to spread their experiences to others. The project lasted for three years, August 2002 to August 2005, and was co-financed by the EU Life Environment program. The aim was to use, assess and evaluate environmental tools.



The companies in the project team have conducted individual studies and environmental projects, separately and together and Chalmers has contributed with analyses, new structures and generalizations of how to use the tools and methods within the companies. The results have been published on a web site, www.dantes.info. In addition to project reports, a visitor also can find information about the project and useful links.

¹ DANTES is an acronym for *Demonstrate and Assess New Tools for Environmental Sustainability*

The project language is English. Approximately thirty people have been involved in the project. During the three years, the website has been visited 53 000 times and the project and its results have been presented for more than 3900 people.

Results

DANTES is not a tool, nor a method, but rather a tool box. DANTES presents examples of how different environmental work can be carried out. The toolbox presented on the web site can be used in many different ways by employees within Akzo Nobel, ABB, Stora Enso and Chalmers and other companies as well as by local and national authorities, organizations and within the educational system.



During the project, a range of studies and projects have been conducted to show and assess how environmental tools and methods can be put to practical use. Since the project is a Demonstration project (an EU project aimed to demonstrate and spread environmental information) the project web site www.dantes.info was constructed early in the project. The web site has been continuously updated and is still updated after the project has ended in September 2005. The project members have also written articles, held presentations at other companies and universities, and attended international conferences.

During 2005, a DANTES conference was arranged in Gothenburg. The 53 participants were mainly Swedes, but other parts of Europe and the rest of the world were also represented. The objective of the workshop was to show the usefulness of the tools and methods and also to initiate discussions on possible continuations and developments of the DANTES web-site.

The project web site, www.dantes.info

Availability and functionality have been very important aspects when designing and constructing the project web site. Professionals as well as people with environmental interests and basic environmental knowledge should be able to use the web site as a source of information and inspiration or as an introduction to tools and methods for environmental assessment. The DANTES project has not developed new tools and methods, but used and assessed available tools and given examples of how these can be used within industry.

The project web site is divided into three main categories;

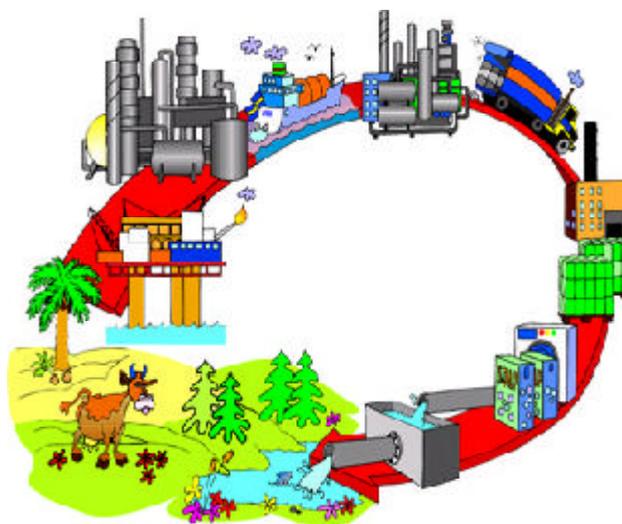
- * Strategies- examples of how the tools and methods have been combined and practically and experiences from each work
- * Tools and methods – descriptions of available tools and methods that have been used and evaluated within the project
- * Publications – All written project reports and case studies are published here and can be downloaded

Example of tools and methods – Life Cycle Analysis

Life Cycle Analysis, LCA, is a frequently used tool within the DANTES project. An LCA assesses the environmental impact of a product or a process from a life cycle perspective, which means that the product or process is followed from extraction of raw materials through production and use,

to disposal or recycling.

The environmental impact is summarized and the result show for example how much energy and raw material that is consumed during the life cycle and how much emissions to air and water the product or process will generate.



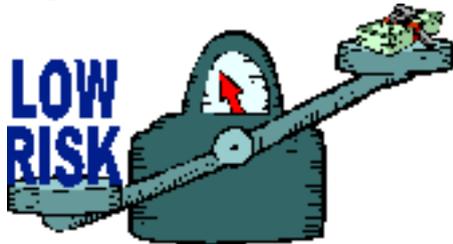
A Life Cycle Assessment can be used in e.g. product development projects to identify the activities that have the largest environmental impact during the products life cycle. Improvements can then be made that have the largest influence on the environmental impact of the product. Life Cycle Assessments can also be used for marketing purposes to show customers the total environmental impact of the delivered goods or services.

The Life Cycle Assessment is further described under Tools and methods at www.dantes.info, where a range of LCA studies, performed within the project, also can be found.

Example of tools and methods – Environmental Risk Assessment

The Environmental Risk Assessment, ERA, another frequently used tool, shows the potential risks for detrimental effects to humans or the environment related to producing or using a product. There are different types of risk assessment, but within the DANTES project chemical risk assessments are the most frequently used. The chemical risk assessment

evaluates whether a chemical substance can be produced and used without exposing humans or the environment to health risks. The chemical product is studied from production to recycling or disposal. The ERA can assist the company in avoiding unwanted surprises, since it identifies the potential risks attached to a chemical and it shows whether e.g. further knowledge of the chemical is needed.



The coming EU chemical regulation, REACH, will put demands on producers and importers of chemicals to provide an ERA for chemicals produced or sold in large quantities.

Strategies

A structured and systematic environmental work at all levels in a company is essential to fulfill the environmental goals. The strategies described within DANTEs show how such work can be conducted efficiently. The strategies are guidelines on how to use tools and methods for environmental assessment.

The strategies are based on how tools and methods are being used within the business of Akzo Nobel, ABB and Stora Enso, but the results can easily be transferred to other businesses. Furthermore, Chalmers contribute with experiences from their other collaboration partners in other business sectors. The strategies can be described as journeys from question to answer, where relevant information is gathered and processed to be used in decision making.

Examples of questions that the strategies answers are;

- * In what situations and by whom in a company can this tool be used?
- * What is the working procedure when using this tool?

- * Which are the potential risks and benefits related to this tool?

The strategy for conducting a Life Cycle Assessment is based on ABB's experiences and describes different types of LCA, the working procedure, ABB's experiences and the business value of using LCA.



Environmental impact

Experiences have been gained and exchanged by the four partners, who thereby have improved their internal environmental work. Examples of improvements are better understanding of internal tools for environmental assessment, better communication of the environmental work to stakeholders inside and outside the participating companies, and increased environmental awareness within the companies. At Akzo Nobel for example, environmental concerns have become a prioritized issues for the top management and the work of DANTEs is widely spread within the company globally. It is hard to measure the decreased environmental impact that DANTEs has led to, but it is obvious that environmental improvements have been made within areas such as transportation, production, energy consumption and waste management.

Other companies have showed an interest in the results of DANTEs and there are several examples of companies that have

used the information directly to improve their environmental work.

Costs and benefits of project results

By identifying the company's environmental impact and having a structured environmental work a company can reduce the environmental costs significantly. By being one step ahead, a company is better prepared for coming demands from authorities and society. The short-term costs of active environmental work become a long-term profit. Decreased energy and raw material consumption and improved waste handling give environmental benefits but also economical savings for the company. Two examples of how the companies in the project have reduced their environmentally related costs are presented below.

Example 1 Strategy for analyzing the environmental impact of transportation

A strategy for assessing the environmental impact of transports has been developed by Akzo Nobel within the project. Akzo Nobel continuously evaluates the environmental impact of its transports to and from production sites in Sweden. Improvements in transportation have led to direct economical and environmental benefits. For example, the coefficient of effectiveness has increased which has led to a reduced transport distance. The annual transport studies also help to identify which improvements that are most beneficial for the environment.

Example 2 Strategy for including sustainability aspects in Gate model for product development

In a Research and Development project it is important to include sustainability aspects (often including economic, environmental and social aspects) from the start, since it is more costly to take new aspects into consideration at a later stage in the development process. Therefore; ABB has developed a strategy for including sustainability aspects in their Gate model, a frequently used project model in Research and Development projects. By including sustainability issues from the start, unforeseen costs are reduced, and not sustainable projects can be identified and declared closed at an early stage, which saves money for the company.

Transferability to others

The applicability of the tools and methods as well as the functionality of the web site is very important and the number of visitors and the positive feedback show that other stakeholders visit the web site regularly and use the contents. This indicates that the transferability of the project results is good.

The DANTES project has shown how the four members perform their proactive environmental work and the results are based on the experiences of the four partners. The results are however not industry sector specific, but can be used in similar situations in other companies, by authorities, organizations or in the educational system. All published material on the web site is free to use. The website will be continuously updated even after the end of the project and our hope is that it will be widely used ever after



www.DANTES.info



For more information, visit www.DANTES.info or contact;

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