ABB Low Voltage Products and Systems and the Environment – Vision, Responsibility, Performance and Practice

Low Voltage Products and Systems

„In recent years, we have seen an increasing concern for the environment expressed by different players in the market, with a particular focus on the efficient use of resources, the prevention of pollution and the protection of human health. In addition, customers demand greater efficiency and cleaner products.

Our intention is to find the right combination of precautionary actions that minimize product life cycle costs and at the same time promote economic and environmental benefits for both ABB and its customers. ABB's environmental strategy is committed to complying with the ICC Business Charter for Sustainable Development and contains the following elements:

- *Developing and supplying eco-efficient products and systems*
- *Continuously improving our own environmental performance*
- *Sharing state of the art technologies with emerging markets*
- *Contributing to common efforts*

This brochure provides information about our intentions, actions and the state of our Environmental Management System. It also describes our program to improve continuously the environmental performance of our products and our production sites.

Tom Sjökvist
Business Area Manager Low Voltage Products and Systems

VISION AND REALIZATION

GLOBAL OBLIGATION

Many things have been said about the environmental responsibility of a company like ABB as a global player in the field of electrical engineering. With more than 200,000 employees worldwide, ABB has an impact on the environment directly and indirectly in various ways: with our production processes on the one hand and through the use and disposal of our products by our customers, on the other.

ABB is aware of its environmental responsibility and takes up the challenge, as put by former Norwegian Prime Minister Gro Harlem Brundtland: "To meet the needs of the present without compromising the ability of future generations to meet their own needs".

ABB's commitment in this direction has been manifested in ABB's Corporate Policy[1] and in our Environmental Management Program established in 1993. Moreover, ABB publicly supports the Declarations of the UN summits on the environment of Rio, Kyoto and Buenos Aires.

ABB is committed to adhere to the principles of Sustainable Development according to the ICC-Business Charter[2], published in 1992 at Rio.

NEW CONCEPTS

ABB's integration of environmental management into its business strategy has implications not only in an abstract philosophical sense but especially in the real activities of our companies and in the everyday dealings between us and our customers.

Our efforts towards Sustainable Development comprise different elements:
- promoting sustainable resource use and efficiency
- promoting pollution prevention
- protecting ecological and human health
- promoting environmental equity

which then leads to very concrete tasks:
- development and manufacture of eco-efficient products and systems
- continuous improvement of the environmental performance of our sites
- sharing state of the art technologies with emerging markets
- contributing to common efforts

The ABB Business Area Low Voltage Products and Systems is committed to these principles. The wide range of activities and achievements in our various production sites are proof of our efforts in this direction.

MAIN STEPS

ABB Low Voltage Products and Systems is completing its worldwide Environmental Management System (EMS) in several steps:

1. Installation of EMS at all main manufacturing sites
2. Certification of installed EMS according to ISO 14001[3] or EMAS[4] by external auditors
3. Development of Environmental Declarations for core product lines to identify, improve and declare their environmental performance during the product life cycle
4. Application of Life Cycle Assessment studies in the research and development of new products

[1] cf. ABB Environmental Management Reports 1997 and 1998
[2] International Chamber of Commerce
[3] A series of international standards for environmental management systems, auditing and definitions
[4] Eco Management and Audit Scheme, an EU regulation of environmental management systems

BENEFITS FOR OUR CUSTOMERS

Increases Economic Efficiency
- *Less energy consumption*
- *Less material*
- *Less waste*

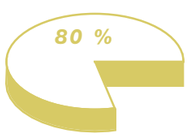
Increases Competitiveness
- *Innovative products*
- *Anticipated requirements*
- *Qualified, eco-trained employees*

Limits Risk Exposure
- *Reduced dangerous material*
- *Increased emergency prevention*
- *Higher safety*

Improves Image
- *Goodwill*
- *Acceptance*
- *Credibility*

Ensures Legal Compliance
- *Legal conformity*
- *Protection from legal claims*

Percentage of product sales from certified factories.



THE ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

ABB Low Voltage Products and Systems develops, produces and sells a wide assortment of products in the low voltage area. We offer complete product lines for power distribution, electrical installation in buildings, industrial applications and machine manufacture.

All our products are regularly tested for reliability and safety. They are known for their high quality in accordance with international standards and already have a good environmental performance in general. In some cases they are even considered to be the benchmark of the industry. However, we are aware of the fact that performance – including environmental performance – must always be improved.

We have therefore systematically implemented an Environmental Management System (EMS) in our companies. Since its introduction in the mid 90's this program has developed successfully and is increasingly understood and anchored in all main sites of our business area. Most of them have already been certified according to ISO 14001 or EMAS.

An implementation of an EMS requires, among other things, environmental goals and programs for each production site, core product line and main activity. Most companies in our business area have already identified environmental goals and programs based on environmental performance indicators according to the draft standard ISO 14031.

This has already achieved tangible benefits in reduced environmental impact and lower costs of products and processes. Such programs especially meet the requirements of our environmentally concerned customers.

PARTNERS

Another big part of EMS is the application of ABB's environmental standard to suppliers' products, services and processes in order to identify their level of compliance and to agree on any necessary adjustments needed to reach our standards step by step. To this end environmental aspects are rated as equally important as other criteria like quality, price, service or delivery times. All our sub-suppliers are chosen carefully, taking into account their awareness of environmental responsibility in the design, production and delivery of their products.

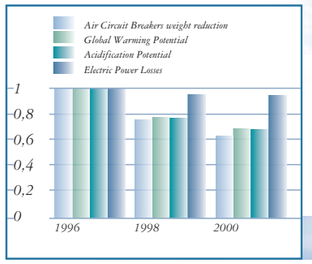
A third goal of EMS is to train and motivate employees, so they have the necessary awareness and commitment to carry out their tasks in an environmentally responsible manner.

EMS is becoming more and more an integral part of the Total Quality Management (TQM) system of individual ABB companies. This has far-reaching benefits for all our customers and business partners.

We expect that in the near future also external auditors will be able to testify in one combined step that our sites fulfil the requirements of Quality Management and Assurance (ISO 9001) and Environmental Management (ISO 14001).

ABB's Heidelberg production site

Environmental performance improvement of ABB breakers



ABB'S ENVIRONMENTAL PERFORMANCE

THE PRODUCTS

We are committed to the principles of Sustainable Development. To treat the environment with care, to develop products and systems that fulfil the highest environmental requirements is one of ABB's corporate objectives that is also shared by the majority of our customers. Therefore, it is very important to make the best possible use of resources already in the design phase and to improve the efficiency of the production processes. These include environmental pollution and waste (gas, wastewater, toxic substances, etc.) which have to be minimized.

All our products will be delivered to our customers in recyclable or even reusable containers or packaging. The majority of materials we use in production is recyclable, too. Whenever a new product line is under development, the ecological factor is as important as cost efficiency and performance. For instance, we try to reduce superfluous material or use more ecologically sound materials. All this happens with the user of our products in mind.

LIFE CYCLE ASSESSMENT (LCA)

Our products and systems consist mainly of steel, copper and plastic materials and some electronics. Special design rules ensure that the impact of products on the environment during their life cycle is minimized.

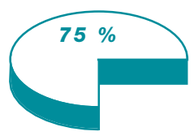
A life cycle assessment according to ISO 14040 appraises and quantifies the total environmental impact of products or activities over their entire lifetime, from production to end of life. An LCA consists of three complementary components – inventory analysis, impact analysis and improvement analysis. An LCA tool has been introduced in all development departments of our business area to provide the most effective support for our environmental initiatives.

A life cycle analysis of a typical product starts with the production process itself, with particular emphasis on material and energy consumption, emissions and waste. Other phases of the product life cycle like logistics and dispatch to our worldwide sales companies and customers can also be examined. Furthermore, the energy consumed during use of our products by our customers is also considered. Questions of recyclability and ecological disposal after use are covered in the last part of the LCA.

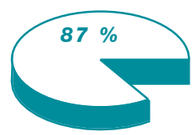
ENVIRONMENTAL DECLARATIONS FOR PRODUCT LINES

By focusing on the above-mentioned criteria and gradually adding new indicators, our business area strives to be better able to meet the ever-increasing demand for environmental information. To improve the environmental performance of our core product lines we use performance indicators as proposed by draft standard ISO 14031. These allow us to monitor progress in meeting our environmental goals, concerning consumption of energy, materials, reduction of waste, emissions etc. This activity started in 1998.

Environmental Declarations covering core product lines



Training with Life Cycle Assessment tools in the units of the business area

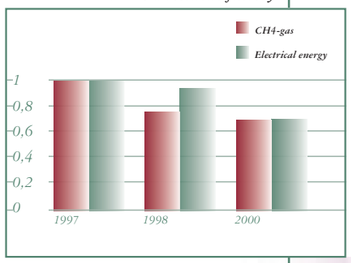


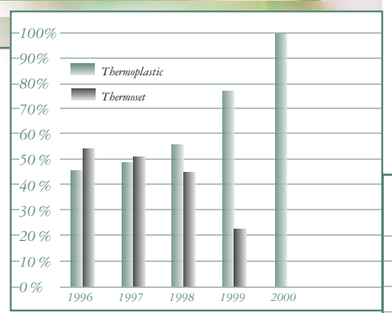
INFORMATION INCLUDED IN AN ENVIRONMENTAL DECLARATION (EXAMPLE)

	SIGNIFICANT ENV. ASPECTS	ENV. PERFORMANCE 1997	ENVIRONMENTAL GOAL	ENVIRONMENTAL PROGRAM
DESIGN/ MANUFACTURING	*- use of electrical energy*	*- 5,735,000 kWh*	*- reduce by 15 %*	
	- use of plastics	*- 304.4 tons/year*	*- unchanged*	
	- use of chemicals	*- 180 different*	*- reduce number by 25 %*	
	- use of CdO in contacts	*- 50 kg/year*	*- eliminate*	***R&D project incl. in 1998/99***
	- metal scrap	*- 220 tons/year*	*- reduce to 70 tons/year*	
	- solder waste	*- 10 kg/year*	*- eliminate*	
OPERATION	*- use of energy*	*- N/A*	*- minimize*	
DECOMMISSIONING	*- different plastic parts*	*- N/A*	*- labelling*	***R&D project incl. in 1999/2000***

This example of an environmental declaration applies to a range of large low-voltage contactors with a manufacturing volume of 500,000 units per year.

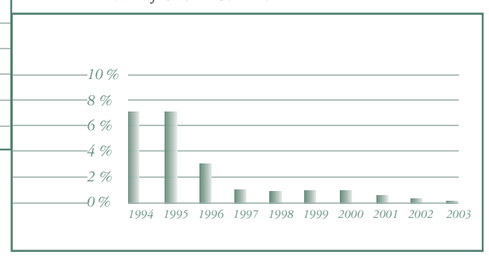
Reduction in energy consumption for ABB's Frosinone factory



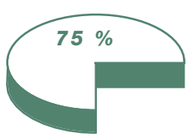


Recyclable thermoplastic will replace thermoset at ABB's Västerås factory

Amount of CdO in Contacts



Certified main production sites according to ISO 14001/EMAS



ABB'S ENVIRONMENTAL PRACTICE

DESIGN

Our goal is to supply customers with environmentally sound products. Product development has to take into account all stages of a product life cycle: from production (parts, components, products), logistics and use to decommissioning and recycling.

Our design work has a permanent focus on:
- reduction of material consumption by size and weight of the products
- preference for ecologically friendly raw materials
- further reduction in the use of hazardous materials such as Cd, Br, etc. with the goal of eventually banning these materials from our products
- replacement of thermoset material by thermoplastics which can be recycled much more easily
- concentration on preferred standard materials (especially plastics) to reduce the variety of different types
- increased application of LCA tools to assess the environmental impact of alternative designs and to choose the optimum solution

MANUFACTURING

Most of our main production sites have been internationally certified according to ISO 14001/EMAS. Critical assessments – including the views of external parties – have identified the main potential for improvement in the factories.

A regular follow-up system on the continuous improvement programme is running at management level with a special focus on:
- systematic reduction of waste by improved waste separation during the production process and consequently enhanced recyclability of the production waste
- less use of hazardous material in production processes by changing processes or by using ecologically friendly material
- stepwise reduction of emissions to air, water and of noise, by investing in necessary filters, applying alternative solutions etc.
- reduced consumption of electrical energy

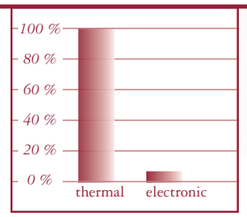
Our products include components supplied by other companies. Improving our environmental management also means involving our suppliers of materials, parts, production machines etc.

We have started to control the environmental performance of our suppliers: first by distributing questionnaires/checklists of environmental requirements and later through environmental audits and inspection systems with our supply management activities. This approach has been beneficial: Our suppliers were made aware of the importance of environmental criteria for ABB and in several cases steps for improvement have been taken to meet our requirements.

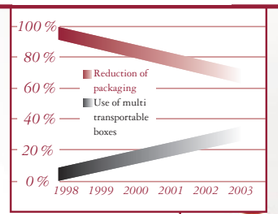
ABB's Luedenscheid factory

Waste management in ABB factories

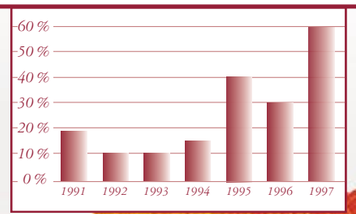
Reduction of power loss in ABB's overload relays



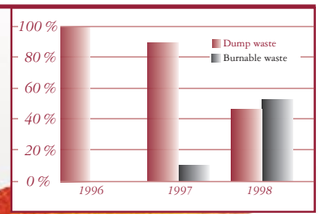
Packaging at ABB's Logistics Center in Heidelberg



Example: Västerås Recyclable waste



Example: Vaasa Industrial waste



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Lüdenscheid
Germany

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Vittuone
Italy

ABB Stotz-Kontakt GmbH
Heidelberg
Germany

CMC Carl Maier + Cie AG
Schaffhausen
Switzerland

ABB LV Systems AB
Västerås
Sweden

ABB Control Oy
Vaasa
Finland

ABB CMC Systeme AG
Lenzburg
Switzerland

ABB'S ENVIRONMENTAL PRACTICE

PACKAGING

We try to reduce the use of packaging materials coming into and leaving our factories, by activities such as these:

- suppliers deliver parts/materials without any packaging to the production sites
- introduction of a returnable transport container system using multi transportable boxes (MTB) instead of traditional boxes, reducing disposal costs and guaranteeing long life circulation.

We expect reduction of packaging by 30-40 % in the next few years, also supported by activities as

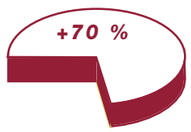
- replacing plastic chips by material made from renewable resources e.g. wood, for packaging
- shredding suppliers' packaging and using it as padding material

USE

The use of Low Voltage products and systems causes some energy losses but occurs practically without any consumption of material.

- consumption of energy during life time has been reduced with each successive new product generation
- consumption of special materials such as silver, etc. is limited to the values necessary to provide the stated performance
- electrical emissions are limited according to the rules and laws, EMC-directives, etc.
- space, size and weight of our products have been permanently reduced, resulting in less material, and less space needed for installation

Simplified recycling of control gear by identification of plastic parts



DISPOSAL AND RECYCLING

ABB's Low Voltage products and systems are designed for easier disassembly and recycling

- easy disassembly already by design
- application of identification marking of plastics to simplify recycling at the end of the product's life
- reuse of recycled plastics in our own production processes
- reduction of number of materials in the products

Products to help customers improve their ecological performance: ABB i-bus EIB.

A good example of how ABB Low Voltage Products and Systems can help customers is the ABB i-bus EIB (European Installation Bus). This is a modern bus technology system for the automation of buildings. It can be used for almost all control functions within a building, e.g. heating and air-conditioning, lighting, control of shutters and blinds, etc. There are many ecological benefits. Lights are only turned on where needed by the use of motion sensors. Automated blinds and shutters, letting the heat in but keeping the cold out, work together with the heating and air-conditioning to maintain a comfortable temperature while consuming only as much energy as is necessarily needed.

Besides helping to conserve energy, ABB i-bus EIB and its various devices also comply with the highest ecological standards. For example, the "EIB bus cable" is only a single control cable which means considerably less wiring and therefore less use of material. The plastic cases of the individual components are made of easy to recycle material. Parts exceeding 5g are labeled in accordance with ISO 11469. The plastics used are free of cadmium and arsenic additives and do not contain furane or dioxine-generating substances. The metallic parts used are free of carcinogens. In Germany, proceedings are underway to allow the labeling of EIB components with the German quality mark, "the Blue Angel". This sign is a recognized distinction awarded only to products that fulfil certain criteria of sustainable development. All components of ABB i-bus EIB satisfy these requirements perfectly.

OUTLOOK 2000

Our activities in the area of Environmental Management will continue along the same lines as described in this report.

SITES

The implementation of ISO 14001 will cover those remaining sites that did not complete the certification in 1998; some companies will additionally refresh their certification for the second/third time.

PRODUCTS

The integration of environmental management into the strategic plans of all units of our business area will be further intensified. The process of developing Environmental Declarations for our main product lines will be extended in a more formal way, utilizing BA standardized environmental performance indicators according to ISO 14031.

This tool will help us improve the environmental performance of our processes and of our products during their life cycle in the right way with effective measures. The application of life cycle assessment according to ISO 14040 will support our R+D teams in identifying the potential for improvement and finding the right solutions.

VISION

We strive to reduce the environmental impact of our production processes at each site, and of each product, in a continuous way.

This report describes our vision, goals, environmental management system and the program to achieve our goals fulfiling ABB's commitment towards sustainable development.

with compliments

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