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## State-of-the-Art Technology in the Electronics Industry Innovation System

### Background

The State-of-the-Art technology report is following a comprehensive "Innovation System Approach". The ECOLIFE II report focuses on the product-service life cycle of electr(on)ic products, and reflects the fact that in an Innovation System key players in all of the various stages of the product-service life cycle - component suppliers, product manufacturers, service and logistic providers, processing industry etc - are involved in the innovation process.

### Main Areas

Three main categories Dialogue, Strategy and Tools have been embedded into the main stages of the life cycle of an electronic product. Main stages are Design - Manufacturing - Use - End-of-Life and Management (understanding "management" as a horizontal task throughout the life cycle). Figure 1 shows the life cycle stages and the underlying categories.

A summary report showing the main findings of our analysis can be obtained from the project coordinator and is available on the project web page.

### Technology Evaluation Methodology

To evaluate the technologies in view of sustainable development in the Electronics Industry, a Sustainability Scorecard (STS Approach) has been used. Technologies have been evaluated with respect to their contribution to sustainable growth in the Electronics Industry Innovation System. Therefore additional indicators are used beyond technological performance indicators to describe, whether the technology indicates a move towards sustainability. Further technologies have been evaluated regarding their development stage as well as the need for action.

ECOLIFE II refers to "Technologies for sustainable Development in the Electronics Industry Innovation System" by defining them as *all measures, instruments and (management) tools, both hardware and software, helping to move the Electronics Industry Innovation System towards sustainable growth, i.e. meeting the requirements of the triple bottom line of economic, ecological and social improvements in the Electronics Industry.*

Obtain the summary report from the project web page or contact the project coordinator

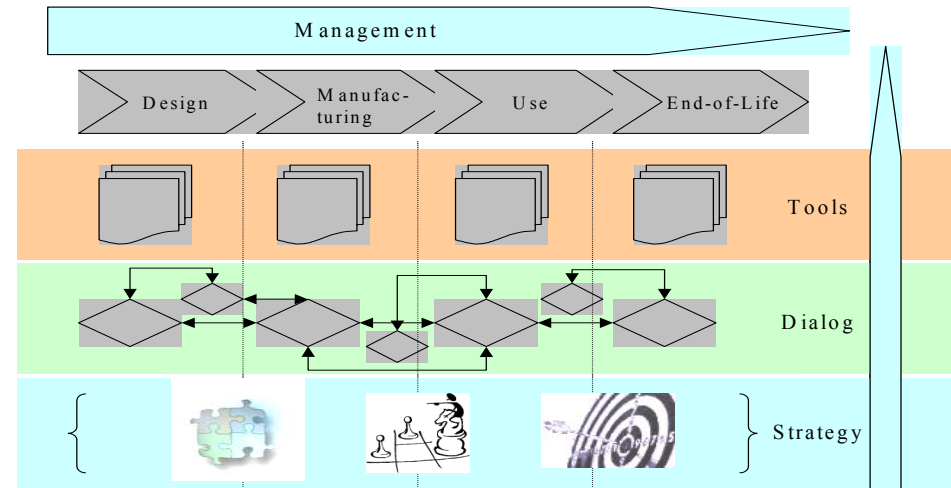


Fig 1: Conceptual Framework of ECOLIFE II State-of-the-Art Technology report

### Stage 1: Design

In the area of dialogue, special attention is paid to the Eco-design relationships to suppliers asked how to secure design requirements within the supply chain of the Electronics Industry Innovation System. For the Strategy section, the state-of-the-art of DfX is described (X stands for X=Environment, X=chemical content, X= disassembly) as well as strategies to integrate DfX into conventional management systems and into the product development process. On the level of "materials", some issues of hazardous materials and renewable materials are tackled. Finally in the Tools section, the actual developments in LCA and LCE, databases, teaching curricula, environmental benchmarks, new substrates for PCB, halogen-free and new flame retardants are described.

### Stage 2: Manufacturing

The strategy section describes new strategies for manufacturing gaining competitive advantage (i.e. cleaner production). The new innovative manufacturing technology section describes promising manufacturing technologies that can significantly contribute to a future sustainable manufacturing practice in the electronic industry (i.e. rapid manufacturing). In the tools section, innovative developments in different tools for analysis and improvements of manufacturing systems

(both individual subsystems and as a whole) are described.

### Stage 3: Use

The main topics in this section are customer information and education on usage, communication of product impacts to the consumer, energy efficiency in use and new business models.

### Stage 4: End-of-Life

ECOLIFE 1 already reported on the state-of-the-art of certain End-of-Life technologies, beginning with identification technologies and separation, as well as touching upon health and safety aspects. The work also summarises financial aspects (covering collection and processing implications) and strategies for re-use and upgrade of discarded electronic products. Finally, new management strategies have been discussed in order to meet future requirements in the End-of-Life sector. The future needs, defined in ECOLIFE 1 have been taken up in ECOLIFE 2. The state-of-the-art of these technologies is presented in the report.

### Management

The role of the management function to green the electronics industry has been analysed.

## ACTIVITIES

### Green Electronics – ECOLIFE II public Workshop 10 years of CARE Electronics 5 years SCARE project March 1/2, 2004, Budapest

On the **first day** you will learn:

- the latest news on the different national proposals for implementing the EU legislation (especially in the new member states in Central and Eastern Europe),
- different re-use and recycling possibilities of products (white goods, consumer electronics, IT products) as well as components,
- technologies (logistics, ...) that enable and facilitate re-use and refurbishment and
- the differences in processing WEEE in Central and Eastern Europe compared with the rest of Europe.

On the **second day** you will learn:

- the outcomes of 10 years European research in the framework of the CARE Electronics network as well as the
- Strategic CARE project SCARE, best practice examples in ecodesign of electr(on)ic products,

- what will be the state-of-the-art technology in the electronics industry innovation system as well as
- which impacts the new EuP-directive (Proposal for a Directive on establishing a framework for the setting of Eco-design requirements for Energy-Using Products) will have on the electr(on)ics industry in Europe.

### Database on Key Players, Movers and Shakers

The objective of this exercise is to draw up a list of key players / movers and shakers in 3 areas:

1. **Companies**  
active among the different stages of the life cycle
2. **Organisations**  
major bodies that influence policy by funding or other means at the national and/or international level
3. **Influencers**  
mayor people that influence policy

The ultimate goal is the collection of the 10-15 most important players in European countries in each category.

Forms are available on the ECOLIFE II web-page.

The database will be available on the web-page on April 2004.

### - AGENDA -

#### 9th public ECOLIFE workshop, March 1/2, 2004, Budapest (HU)

The workshop is organized in cooperation with CARE Electronics. Main topics will be the implementation of the WEEE directive, the ongoing research projects within CARE Electronics and the outcomes of ECOLIFE I & II.

Workshop invitation brochure available at [www.care-electronics.net](http://www.care-electronics.net)

#### Meeting on Product Service Systems, March 3, 2004, Budapest (on invitation)

#### Mid term Assessment Meeting, May 3/4, 2004 (on invitation)

Please order the Environmental Information Guidelines from the project coordinator

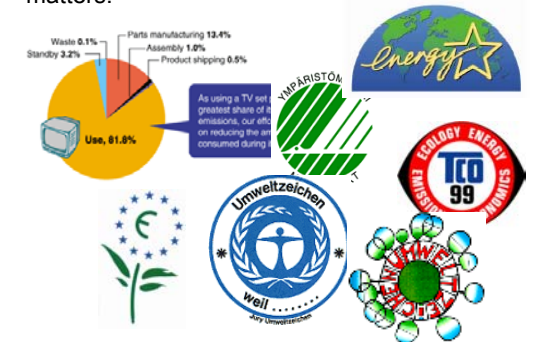
## Effective Environmental Communication

Manufacturers have worked with environmental improvement for a long period of time. They have tried different solutions to lower their environmental impact, e.g. some first looked at the manufacturing processes and improved them, then they went on to improve their products. This work is still going on, many companies are now certified with Environmental Management Systems like ISO 1400 to gain further from good environmental behaviour. Years of research have contributed to an immense volume of information and knowledge, which now can help creating a more sustainable society.

The problem, though, is to transfer this information in an understandable way to the right receivers and help them do their part in a future sustainable society. This is a subject where most companies so far have had little success. There have even been examples of products that have not been launched because of lack of communication of interesting environmental matters, i.e. the positive features were not communicated to a satisfactory level so that customers could understand the extra value of such a product.

The main objectives for this work within the ECOLIFE II network is to investigate the information at hand and to try to guide companies in how to use it; thereby defining two appropriate receivers, the right composition of the information and the right way to transfer it.

To be able to understand what actions companies have taken in their environmental communication to date, a questionnaire was made and sent to electronic companies. The answers received have been collected and evaluated. The evaluation has then been used as a basic knowledge of how companies work, think and communicate environmental matters.



Among a broad range of stakeholders interested in environmental information 2 important areas have been chosen and analysed in more detail:

1. Private customer
2. Supply chain

The report gives an comprehensive overview about medias which can be used for the various communication purposes (internet, printing, CDs, manuals, labels, different kind of environmental reports, material declaration tools etc.). Further a chapter is focusing on environmental accounting and emission trading and how these instruments could be used for a more effective communication.



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