



ECOSIGN

Basic Concepts on Ecodesign

UNIT 13: Final Course Review



Objectives

- Know overall the concepts of Ecodesign already learned.



13.1 Unit 1 INTRODUCTION TO ECODESIGN

13.1.1 General Concepts on Ecodesign

- There is a growing conscience and commitment with sustainability.
- Consumers prove a greater level of commitment.
- They look for a brands that feel the same way towards the environment.
- Companies need to prove their respect and commitment to the environment and natural resources:
 - actions that demonstrate such commitment.
 - ❖ The most outstanding action in this way is ECODESIGN.

ECODESIGN isa systematic incorporation of environmental aspects into product design with the aim to reduce its impact through its entire life cycle.

Ecodesign claims the need of incorporating environmental and sustainability criteria into the basic requirements of product design (costs, function, utility, aesthetics, reliability, safety, etc.).

13.1 Unit 1 INTRODUCTION TO ECODESIGN

13.1.2 Benefits of Ecodesign

MAIN BENEFITS

Thanks to its implementation, **products** prove to be:

- ✓ more respectful
- ✓ to have a greater environmental awareness
- ✓ fulfilling the function for which they have been created
- ✓ without the need to have higher prices

For the **company**, this translates into competitive advantages:

- ✓ Better designed products (cheaper)
- ✓ Different from the competition
- ✓ Green image

Environmental benefits:

- ✓ Less impact of the developed products
- ✓ Greater compliance with the applicable environmental legislation.

Economic benefits

- ✓ Reducing costs with the optimisation of resources
- ✓ Reducing impact of transport activity

Social benefits

- ✓ Better image of the organisation.
- ✓ Different from the competition in ecoadvertising and green advertising.



13.1 Unit 1 INTRODUCTION TO ECODESIGN

13.1.3 Barriers of Ecodesign

- ✓ Some problems may arise while taking decisions and implementing a system.
- ✓ These problems can be solved with the help of experts and a change in mentality towards a more innovative character.

MAIN BARRIERS OF ECODESIGN:

- Lack of experts
- Consider the costs but not the benefit (in the medium term)
- Problems to access information
- Lack of training
- Lack of innovative character

13.2 Unit 2 TRADITIONAL DESIGN VERSUS ECODESIGN

Ecodesign is a design philosophy that claims the need to incorporate environmental criteria into the basic design requirements of a product.

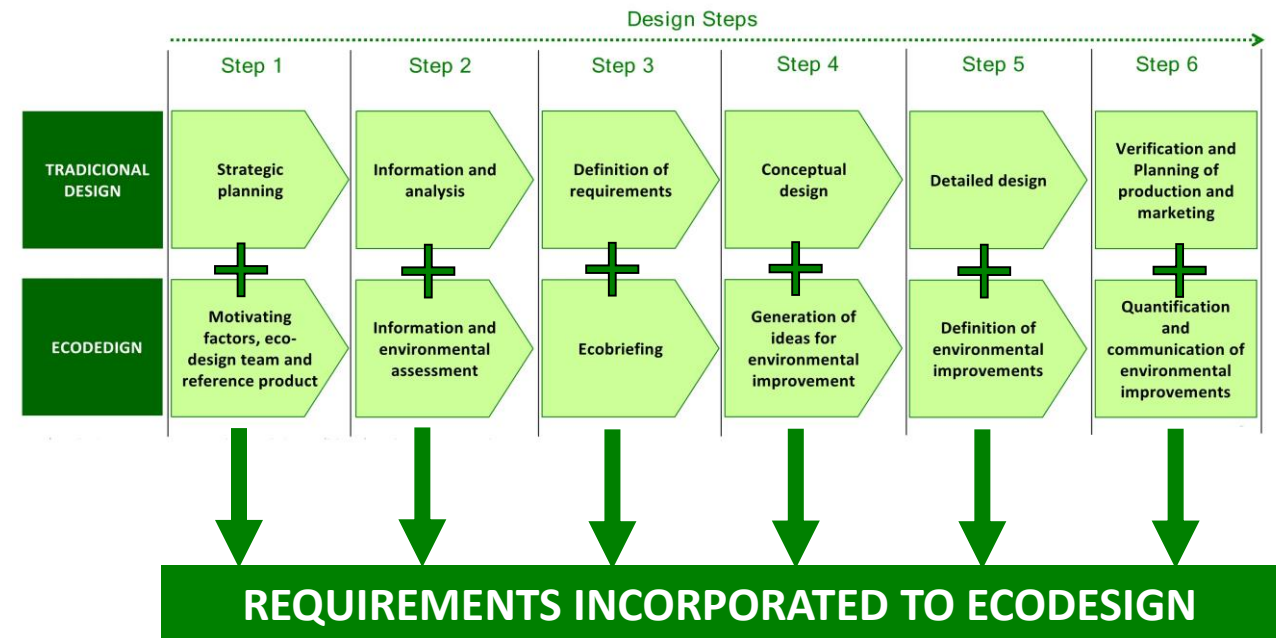
Traditional Design Requirements

Costs, utility, aesthetics, reliability, safety, etc.



Environmental criteria

→ Ecodesign



13.3 Unit 3 EUROPEAN LEGAL FRAMEWORK OF ENVIRONMENT AND ECODESIGN

13.3.1 European Environmental Policy

In the 1970s and 1980s, priority was given to issues of traditional ecology *the protection of species, the improvement of air and water quality by reducing pollutant emissions.*

Currently, it is prioritised that the approach be more systematic and take into account other links between different topics and their global dimension. *It involves moving from rehabilitation to prevention of environmental degradation.*

General principles of the European environmental policy

→ Applied to any form of pollution or degradation

- PRECAUTIONARY PRINCIPLE.
- PREVENTION PRINCIPLE.
- RECTIFYIN POLLUTION AT SOURCE PRINCIPLE.
- "POLLUTER-PAYS" PRINCIPLE.

Legal Framework of European Environmental Policy

13.3 Unit 3 EUROPEAN LEGAL FRAMEWORK OF ENVIRONMENT AND ECODESIGN

13.3.1 European Environmental Policy

BASIC LEGAL FRAMEWORK OF EUROPEAN ENVIRONMENTAL POLICY

Summary of the Legal Framework of European Environmental Policy

- ACTION PROGRAMMES
- HORIZONTAL STRATEGIES
- ENVIRONMENTAL IMPACT ASSESMENT AND PUBLIC PARTICIPATION
- INTERNATIONAL COOPERATION
- IMPLEMENTATION, COMPLIANCE AND MONITORING OF THE LEGISLATION

Examples of actions of the Basic Legal Framework

VII EAP - General Union Environmental Action Programme until 2020

Sustainable Development strategy, Biodiversity strategy, 2020 Horizon strategy...

Projects and programmes assessment

International agreements on a variety of questions

Legislation and regulations for an efficient application

Control entities: EEA (European Environmental Agency), COPERNICUS (previously known as Global Monitoring for Environment and Security), etc.

13.3 Unit 3 EUROPEAN LEGAL FRAMEWORK OF ENVIRONMENT AND ECODESIGN

13.3.2 Legal Framework of Ecodesign

Summary of the Basic Legal Framework for Ecodesign in Europe

- INTEGRATED PRODUCT POLICY
- ACTION PLAN: EFFECTIVE USE OF RESOURCES, ECOINNOVATION, SUSTAINABLE CONSUMPTION AND PRODUCTION, AND CIRCULAR ECONOMY
- WASTE MANAGEMENT AND PREVENTION
- ECOLOGICAL AND ENERGY LABELLING
- INTEGRATED PRODUCT POLICY
- ECO MANAGEMENT AND AUDIT SCHEME (EMAS).
- ECOLOGICAL DESIGN
- GREEN PUBLIC PROCUREMENT
- ENVIRONMENTAL PRODUCT DECLARATIONS EPD
- OTHER VOLUNTARY INSTRUMENTS (STANDARDS)

13.3 Unit 3 EUROPEAN LEGAL FRAMEWORK OF ENVIRONMENT AND ECODESIGN

13.3.2 Legal Framework of Ecodesign

Summary of the general Eco-design standards of the ISO 14000 family of standards.

INCORPORATION OF ENVIRONMENTAL ASPECTS INTO DESIGN

ISO 14006:2011. Environmental Management Systems. Guidelines for Incorporating Ecodesign.

ISO/TR 14062:2002. Environmental Management. Integrating Environmental Aspects into Product Design and Development.

LIFE CYCLE ASSESSMENT

ISO 14040. Environmental Management. Life Cycle Assessment. Principles and Framework.

ISO 14044. Environmental Management. Life Cycle Assessment. Requirements and Guidelines.

ISO 14047. Environmental Management. Life Cycle Assessment. Illustrative Examples on how to apply ISO 14044 to Impact Assessment Situations.

ISO/TR 14048. Environmental Management. Life Cycle Assessment. Data Documentation Format.

ISO/TR 14049. Environmental Management. Life Cycle Assessment. Illustrative Examples on how to Apply ISO 14044 to Goal and Scope Definition and Inventory.

ENVIRONMENTAL LABELLING

ISO 14020. Environmental Labels and Declarations. General Principles.

ISO 14021. Environmental Labels and Declarations. Self-declared Environmental Claims (Type II Environmental Labelling).

ISO 14024. Environmental Labels and Declarations. Type I Environmental Labelling. Principles and Procedures.

ISO 14025. Environmental Labels and Declarations. Type III Environmental Declarations. Principles and Procedures.

13.4 Unit 4 LIFE CYCLE ASSESSMENT AND COSTS

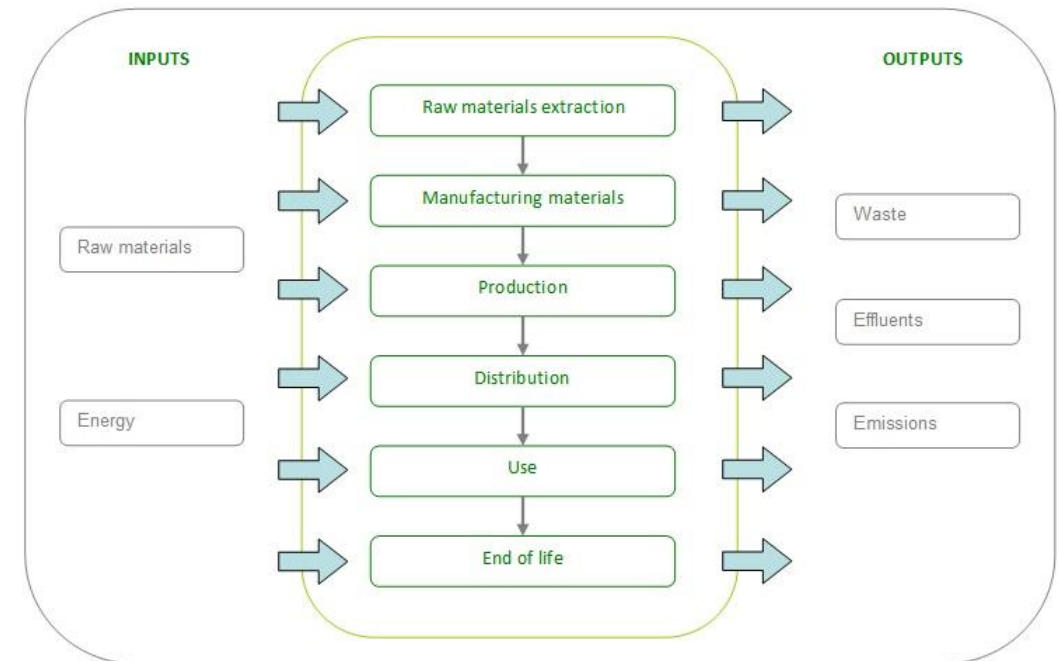
DEFINITION OF “LIFE CYCLE ASSESSMENT”

(According to ISO 14040):

A technique to determine the potential environmental aspects and impacts associated to a product, service or process, with a compilation of the system inputs and outputs; the assessment of the potential environmental impacts associated to those inputs and outputs; and the interpretation of the results from the inventory and impact stages related to the objects of study.

Life Cycle Assessment (LCA) is one of the most used methodologies to improve the environmental behaviour of products, processes and activities.

Life Cycle Stages



13.4 Unit 4 LIFE CYCLE ASSESSMENT AND COSTS

SUMMARY OF THE APPLICABLE STANDARD TO PERFORM A LCA

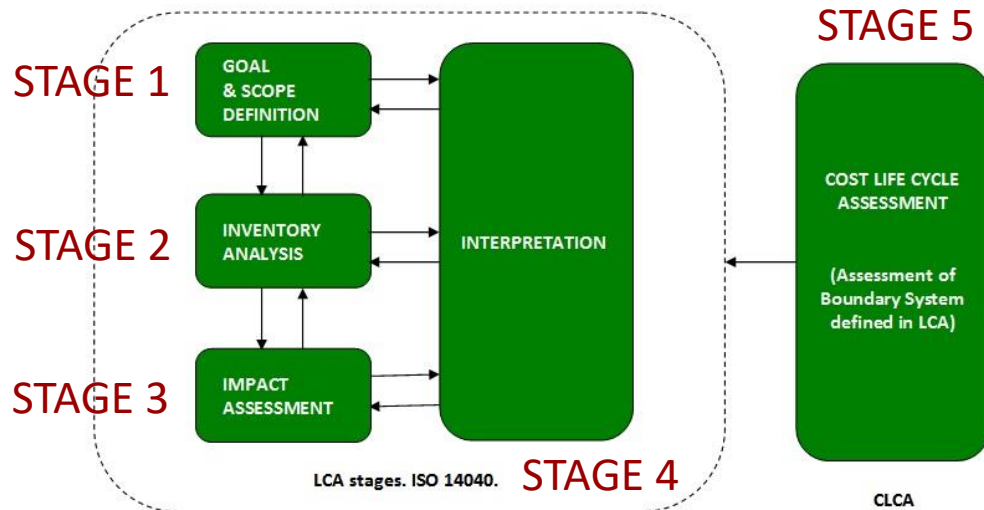
- ISO 14040:2006 Environmental Management. Life Cycle Assessment. Principles and Framework. The specific measures are adopted after.
- ISO 14044:2006 Environmental Management. Life Cycle Assessment. Requirements and Guidelines.
- “ILCD Handbook” (International Reference Life Cycle Data System). 2012. Issued by the European Platform on Life Cycle Assessment.
 - Developed next to the "ILCD Data Network" (reference databases development).

The LCA is the base for sustainable consumption and production, the technical support of:

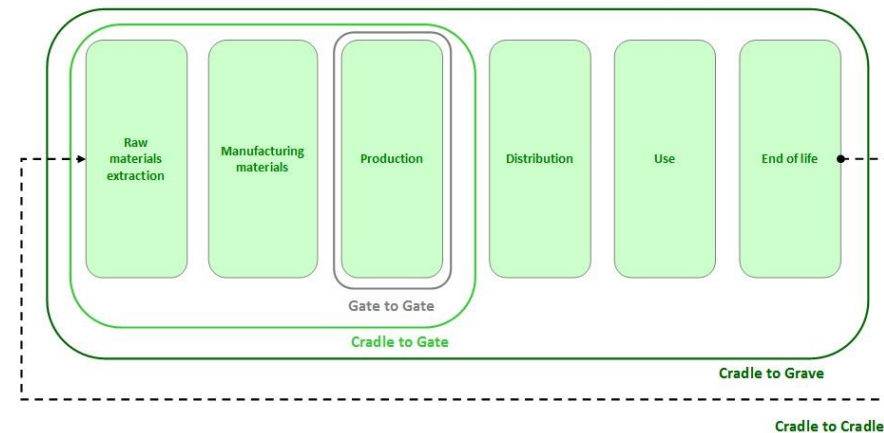
- Ecodesign.
- Carbon footprints (GHG emissions), hydro, environmental, etc.
- Eco-labelling type I (Ecolabel, etc.) y type III (Environmental Product Declaration -EPD).
- GPP: Green Public Procurement.

13.4 Unit 4 LIFE CYCLE ASSESSMENT AND COSTS

MAIN STAGES OF THE LCA



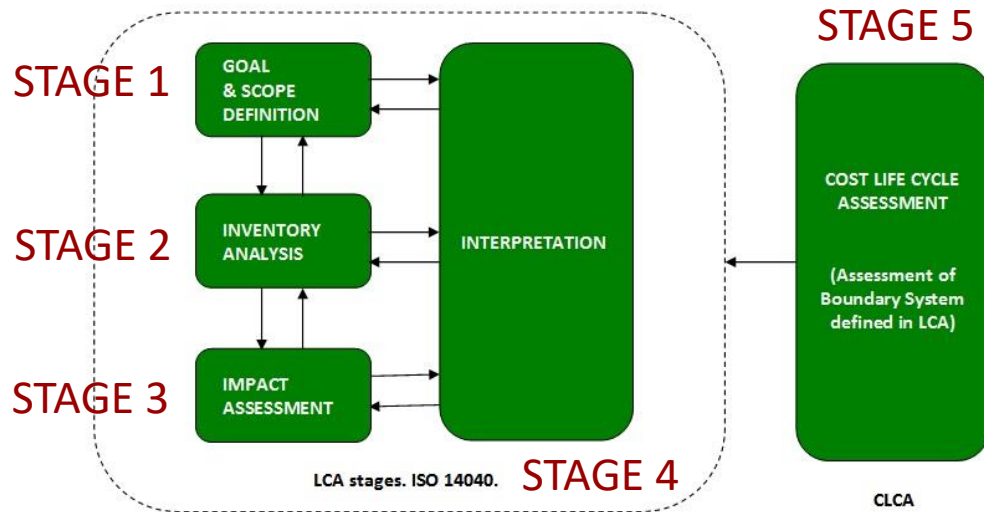
STAGE 1: GOAL AND SCOPE DEFINITION: At this stage the following are defined: aim of the study, reason for undertaking the study, target audience and the description of the chosen system -functional unit, system boundaries, data quality requirements, stated hypothesis, assessment methods, selecting impact categories, etc.



STAGE 2: INVENTORY ANALYSIS (LCI). At this stage the necessary data is collected for the environmental assessment of the product, process or activity. Direct or indirect data (reliable databases).

13.4 Unit 4 LIFE CYCLE ASSESSMENT AND COSTS

MAIN STAGES OF THE LCA



STAGE 3: LIFE CYCLE IMPACT ASSESSMENT: The inventory is translated into indicators of environmental impact relate to the environment.

There are 3 stages: “Classification of impact categories” (Mandatory), “Characterization or “modelling” of inventory data” (Mandatory) and “Normalization, grouping and weighting” (Optional).

STAGE 4: INTERPRETATION OF RESULTS: The results of the two previous stages “inventory assessment” and “impact assessment” are interpreted according to the objectives and scope defined at the beginning.

Conclusions form the assessment results are registered. Identification of the LCA stages with the biggest environmental impact, and therefore may or must be improved.

STAGE 5: LIFE CYCLE COSTING ANALYSIS (LCC): The Life Cycle Costing (LCC) considers all costs, including the environmental impact during the entire life cycle, in the design and development stage of a product, process or activity:

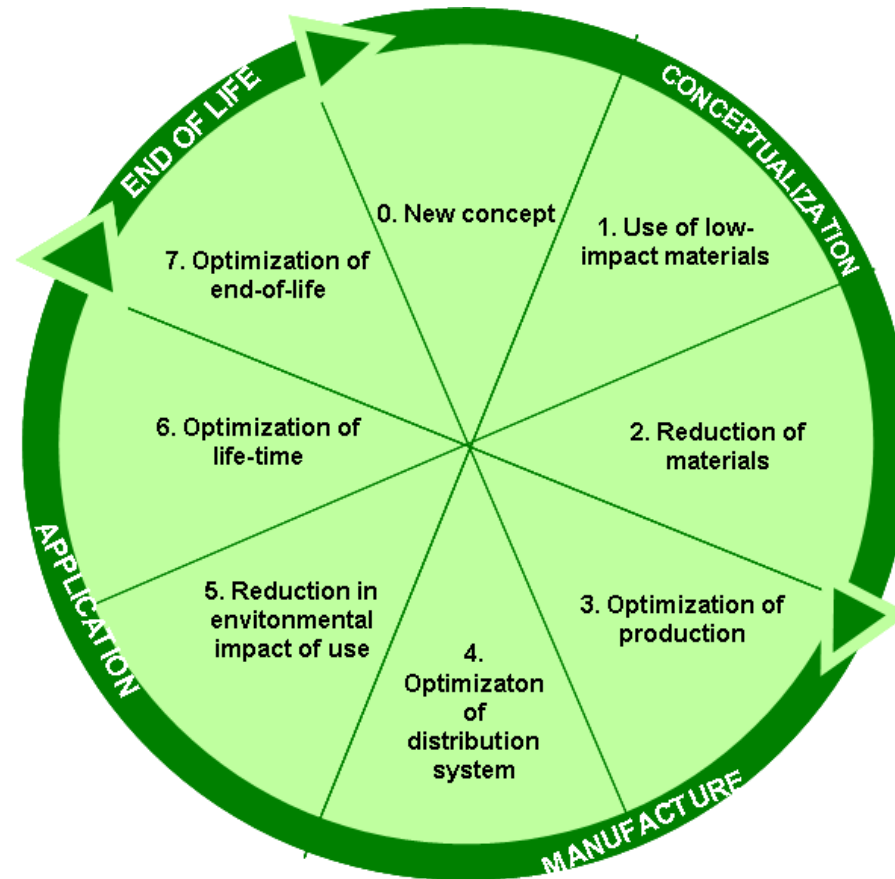
Direct costs of raw materials, energy and labour as well as productivity loss due to generated waste, emissions, etc.

13.5 Unit 5 PRINCIPLES/STRATEGIES OF ECODESIGN

The eight strategies of Ecodesign

The Lifecycle Design Strategies (LiDS) Wheel enables separate the implementation methodology in 4 differentiated levels:

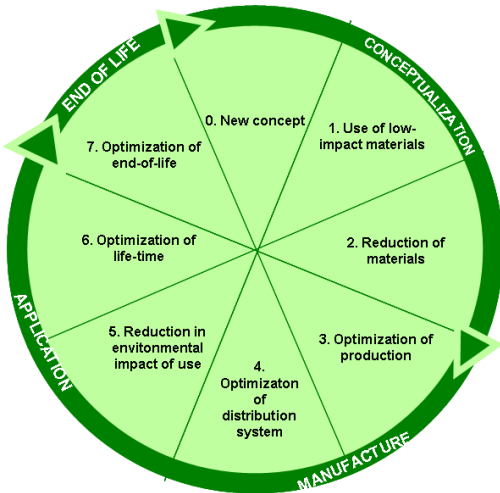
- Conceptualization.
- Manufacture.
- Application.
- End of life.



Impacts cannot be transferred from one stage to another with the application of strategies.

13.5 Unit 5 PRINCIPLES/STRATEGIES OF ECODESIGN

13.5.1 The eight strategies of Eco-design



Strategy 0. New Concept (Optimise the function)

Sub-strategies:

- Dematerialisation; Multifunctionality; Product sharing; Service rather than product.

Estrategy 1. Use of low-impact materials

Sub-strategies:

- Materials: cleaner, renewable, Lower energy content, recycled, recyclable.

Estrategy 2. Reduction of materials

Sub-strategies:

- Reducing of materials use: weight, volume, use of stacking systems, etc.

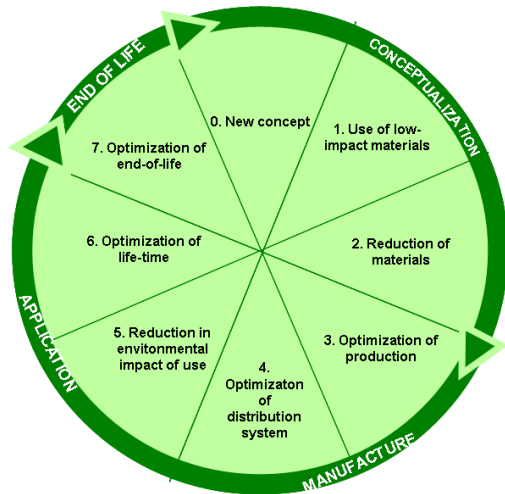
Estrategy 3. Optimisation of production

Sub-strategies:

- Production: alternative, less stages, less energy consumption, reducing waste, etc.

13.5 Unit 5 PRINCIPLES/STRATEGIES OF ECODESIGN

13.5.1 The eight strategies of Eco-design



Estrategy 4. Optimisation of distribution system

Sub-estrategies:

- Packaging material: minimise the amount, cleaner/reusable; energy-efficient transport.

Estrategy 5. Reduction in environmental impact of use

Sub-estrategies:

- Less energy consumption, cleaner energy sources, less and cleaner consumable.

Estrategy 6. Optimisation of life-time (Life cycle)

Sub-estrategies:

- Purpose and durability, less maintenance, easier to repair, modular structure, classical design, etc.

Estrategy 7. Optimisation of end-of-life

Sub-estrategies:

- Recycling of product, remanufacturing/modernisation, recycling of materials

13.6 Unidad 6 ENVIRONMENTAL ASPECTS OF AN ORGANISATION

Every activity generates an impact on the environment.

The impact depends on:

- The consumed resources, waste, dumping and emissions and the results of associated environmental aspects.

DEFINITIONS:

- ENVIRONMENTAL ASPECT : Element that can interact with the environment.
- ENVIRONMENTAL IMPACT: any change to the environment resulting from environmental aspects.

¿HOW CAN AN ORGANISATION ACT ON ITS ENVIRONMENTAL IMPACT?



1. Identifying environmental aspects
2. Assessing environmental aspects
3. Prioritising environmental aspects
4. Establishing objectives, goals and environmental programmes

Organisations can implement an environmental management system: **ISO 14001 or EMAS Regulation**, for identifying and assessing associated aspects, carrying out improvement actions. (See Unit 8).

13.7 Unit 7 IMPLEMENTING ECODESIGN

HOW TO DEVELOP AN ECODESIGN PROJECT



Methodology of the 7 stages

1. PROJECT PREPARATION	Selection of work team. Selecting a product. Motivating factors: external and internal.
2. ENVIRONMENTAL ASPECTS	Identifying and assessing environmental aspects. Tools: “MET” Matrix; Eco-indicators; Assessment software (Ecoscan, Simapro, Idemat, GaBi).
3. IDEAS FOR IMPROVEMENT	Tools: The eight strategies of ecodesign; brainstorming; Priorisation matrix.
4. CONCEPTS DEVELOPMENTS	Development of new product (after ideas for improvement) and selection of environmental improvements.
5. PRODUCT IN DETAIL	Detailed definition of the concept. Iterative process, from definition to detail.
6. ACTION PLAN	Action outstanding. Integration of the strategy within design and management.
7. EVALUATION	Verifying compliance with the target. To obtain project conclusions. Continuous improvement.



13.8 Unit 8 IMPLEMENTING ECODESIGN

EMS: Environmental Management System

- Control processes related to the environment that have an impact on it
- Help managing the environment (reducing, minimising, removing the negative impacts)

EMS seeks to:

“define and document methodologies to carry out activities under control, always from a more environmentally friendly perspective.”

TIPOS

Formal EMS

1. ISO 14001:2015
2. Regulation (CE) nº 1221/2009
3. Regulation (EU) 2017/1505

Informal or not referenced EMS

1. Non auditable, non certifiable systems. They may be effective in a mature and experienced organisation.

13.8 Unit 8 IMPLEMENTING ECODESIGN

13.8.1 Requirement of the Standard ISO 14001

The first 4 sections are generic.

This unit focuses solely on displaying the key points contained in sections 4 to 10.

Specific sections of requirements of the ISO 14001:2015	Requirement
4. CONTEXT OF THE ORGANISATION	Knowledge about the organisation and its “context” and identification of the “interested parties” in that context.
5. LEADERSHIP	Senior management plays an essential role. Commitment.
6. PLANNING	EMS planning.
7. SUPPORT	Training and competences. Communication. Control of documented information.
8. OPERATION	Operating criteria for processes and their control. Determine emergency situations, and establish methodologies to respond.
9. PERFORMANCE EVALUATION	Periodic review of EMS: Internal audit, management review
10. IMPROVEMENT	Continual improvement of efficiency and efficacy. Methodology for the control of nonconformities.



13.8 Unit 8 IMPLEMENTING ECODESIGN

13.8.2 Requirements of the EMAS Regulation



**The EMAS
objective**

**to promote continuous
improvements in the
environmental
performance of
organisations**

General procedure for implementing EMAS in an organisation

- | | |
|--------|---|
| Step 1 | Initial environmental review |
| Step 2 | Implementing an EMS in line with ISO 14001 |
| Step 3 | System checking: internal audit and management review |
| Step 4 | EMAS environmental statement |
| Step 5 | EMS validation by an EMAS verifier |
| Step 6 | Application for registration of EMAS |

EMAS is more complete, since it not only demands compliance with standard ISO 14001 requirements, but also a public environmental declaration. A public register of participating organisations in each country boosts business opportunities.



13.9 Unit 9 ECODESIGN IN THE ENVIRONMENTAL MANAGEMENT

The need to create an international standard to manage ecodesign end in the approval in 2011 of the standard:

ISO 14006:2011: Environmental Management Systems. Guidelines for Incorporating Ecodesign.

Clauses for guidance for the environmental manager:

4. Role of top management in ecodesign
5. Guidelines for incorporating ecodesign into an EMS
6. Ecodesign activities in product design and development

Summary of objectives of the standard ISO 14006

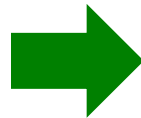
- To establish a systematic methodology to guarantee continual environmental improvement in the design and development processes of products and services.
- Thinking based in all stages of the life cycle of a product or service, and the environmental aspects and impacts associated to each and every one of them.
- To facilitate communication of the environmental performance of companies through an issued certificate, proving compliance with requirements.
- Raise awareness of the market and society about the environmental impact generated by products/services.

13.10 Unit 10 INTRODUCTION TO ECOLABELLING. COMMUNICATION

13.10.1 Types of Ecolabel

Ecolabels allows the organisation to advertise environmental qualities of their products

Three kinds of mechanisms regulated by international standards were officially created and defined



Types of ecological labels according to ISO:

Type I Ecolabel – Ecolabels (ISO 14024).

Type II Ecolabel – Self-declared environmental claims (ISO 14021).

Type III Ecolabel – Environmental Product Declarations (ISO 14025).

Semi type I ecolabels are not inside the family of standards ISO 14020, but they are well known and its use is extended.

13.10 Unit 10 INTRODUCTION TO ECOLABELLING. COMMUNICATION

13.10.1 Types of Ecolabel

Summary of type I, II, III and stemi type I Ecolabels

Type I

 Etiqueta Ecológica Europea (Europa)	 Cisne Blanco (Países Nórdicos)	 Angel Azul (Alemania)
 Ecoetiqueta francesa (Francia)	 Ecoetiqueta holandesa (Holanda)	 Ecoetiqueta húngara (Hungria)
 Environmental Choice (Nueva Zelanda)	 Environmental Choice (Australia)	 Ecomark (Japón)

Type II



Type III



Semi Type I

 Certificación Cadena de Custodia (Normas por países)	 Certificación Cadena de Custodia (Normas por países)	 Oeko-Tex (Suiza)
 U.S. Green Building Council (América)	 Eficiencia energética (América).	 Energía 100% renovable (Italia)

13.10 Unit 10 INTRODUCTION TO ECOLABELLING. COMMUNICATION

13.10.2 Difference between Ecolabels and Product Ecodesign

Differences between Ecolabels and Ecodesign

ECOLABEL	ECODESIGN
Certification associated with a product	Certification associated to the management system (design process)
Evidence that a product meets pre-established environmental criteria and ensures, with that label, that every product from different manufacturers have the same characteristics.	It allows the organisation to choose freely, among the properties of their product or service, where the environmental improvement is carried out through design.
Ensures compliance with certain requirements set in technical specifications (standards) that do not vary over time.	It is based on continuous improvement. That is, the systematic introduction of successive improvements or new product designs is ensured and, therefore, the evolution of the same in terms of sustainability.
A product image improvement.	An improvement of the product image and the system management of the organisation.

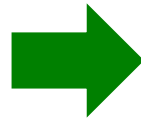
13.11 Unit 11 ENVIRONMENTAL PRODUCT DECLARATION. COMMUNICATION

13.11.1 What is an Environmental Product Declaration?

Environmental Product Declaration (EPD)



**A standardised document
which informs about the
environmental
performance of a product,
material or service**



- Regulated with the standard ISO 14025
- It is different from type I and II labels because an EPD defines neither environmental requirements nor minimums to meet, but displays the results of a LCA to provide data on the environmental behaviour of a product.
- It must be carried out under the standard ISO 14025 (LCA according to ISO 14040 / ISO 14044).
- The EPD must be verified by an independent third party. This term does not necessarily imply the involvement of a certification body.

13.11 Unit 11 ENVIRONMENTAL PRODUCT DECLARATION. COMMUNICATION

13.11.2 Development and verification of an EPD



Stage	Description
1	VERIFICATION OF EXISTENCE OF A REFERENCE PCR "Product category Rules": a compilation of minimum data to include in the LCA, methodology and content of the EPD.
2	DEVELOPMENT OF THE LCA. STAGES: 1.- Goal and scope; 2.- Inventory analysis; 3.- Environmental impact assessment; 4.- Interpretation
3	DRAFTING OF THE EPD: under a specific format defined in the Product Category Rules (PCR) provided by the programme manager
4	VERIFICATION AUDIT OF THE EPD: by an independent third party

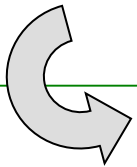
13.11 Unit 11 ENVIRONMENTAL PRODUCT DECLARATION. COMMUNICATION

13.11.3 Product Category Rules (PCR)

EPD verification programmes

→ specify the most detailed way to carry out a LCA and an EPD

PCR gather minimum necessary data to include in the LCA study, the methodology and the EPD content.



PCR are developed by bodies to set common rules in the market for the elaboration and drafting of EPD.

A PCR is usually valid for a period of five years.

The most known bodies are:

- The international EPD Consortium
- “The Japan Environmental Management Association for Industry-JEMAI”
- “Korean Ecoproducts institute KOEKO» y «Korean Ministry of Environment”
- “Norwegian EPD Foundation”
- “Institute Construction and Environment (IBU)”
- “Colegi d’aparelladors, arquitectes tècnics i enginyers d’edificació de Barcelona”
- Asociación francesa P.E.P.

Thank you for your attention

Basic Concepts on Ecodesign

UNIT 13: Final Course Review

