

Keywords
Sustainability
Environmental profile
Product life cycle

EcoDesign Checklist

What Is the EcoDesign Checklist?

The EcoDesign Checklist (see figure 2.6) is a checklist of questions that provides support for the analysis of a product's impact on the environment. The EcoDesign Checklist provides relevant questions that need to be asked when establishing environmental bottlenecks during the product life cycle. Thus, you can use the checklist to complement the MET matrix. The checklist also suggests improvement options for areas where environmental problems are identified.

The checklist starts with a needs analysis, which consists of a series of questions concerning the functioning of a product as a whole. The main question asked in a needs analysis is to what extent the product fulfils its main and auxiliary functions. You should answer this question before focusing on the environmental bottlenecks in the various stages of the product's life cycle. The needs analysis is followed by a set of questions, categorised per stage of the product life cycle (production, distribution, utilisation, recovery and disposal).

The EcoDesign Checklist consists of two columns: the questions to be asked are given in the left-hand columns of the tables. Some improvement options are suggested in the right-hand columns. These

improvement options are derived from the EcoDesign Strategy Wheel (see 'EcoDesign Strategy Wheel' in this section).

When Can You Use the EcoDesign Checklist?

The EcoDesign Checklist is best applied in the concept generation phase, when a clear idea of a product has been developed. You can also use it to analyse existing products.

The EcoDesign Checklist is often used as a tool to avoid missing any environmental impact of the product, and in combination with the MET matrix and the EcoDesign Strategy Wheel (see 'EcoDesign Strategy Wheel' in this section)

How to Use the EcoDesign Checklist

Starting Point

The starting point of the EcoDesign Checklist is a product idea, a product concept, or an existing product.

Expected Outcome

The expected outcome of using the EcoDesign Checklist is a thorough and systematic understanding of the product's impact on the environment. This can be used to fill out the MET Matrix, and to fill out the EcoDesign Strategy Wheel.

Possible Procedure

- 1 Define the product idea, product concept or existing product that will be analysed.
- 2 Perform a needs analysis. Answer the questions from the EcoDesign Checklist.
- 3 Systematically answer all the questions from the EcoDesign Checklist, per stage of the product's life cycle.
- 4 Provide options for improvement following the right-hand side of the EcoDesign Checklist. Describe the options for improvement as clearly and precisely as possible.
- 5 Use the answers to the EcoDesign Checklist to fill out the MET Matrix.

Tips and Concerns

- Make sure you answer all the questions in the EcoDesign Checklist.
- Think about questions you might want to ask yourself that are not in the EcoDesign Checklist.
- Use the EcoDesign Checklist together with the MET Matrix and the EcoDesign Strategy Wheel (see 'EcoDesign Strategy Wheel' in this section).

References and Further Reading

- Brezet, H. and Hemel, van, C. (1997) *EcoDesign: A Promising Approach to Sustainable Production and Consumption*, France: UNEP.
- Remmerswaal, H. (2002) *Milieugerichte Productontwikkeling*, Schoonhoven: Academic Service.

The EcoDesign Checklist

Needs Analysis

How does the product system actually fulfill social needs?

- What are the product's main and auxiliary functions?
- Does the product fulfil these functions effectively and efficiently?
- What user needs does the product currently meet?
- Can the product functions be expanded or improved to fulfil user's needs better?
- Will this need change over a period of time?
- Can we anticipate this through (radical) product innovation?

EcoDesign Strategy @ New Concept Development

- Dematerialisation
- Shared use of the product
- Integration of functions
- Functional optimisation of product (components)

What problems can arise in the distribution of the product to the customer?

- What kind of transport packaging, bulk packaging, and retail packaging are used (volume, weights, materials, reusability)?
- Which means of transport are used?
- Is transport efficiently organised?

EcoDesign Strategy 2: Reduction of material usage

- Reduction in weight
- Reduction in (transport) volume

EcoDesign Strategy 4: Optimisation of the distribution system

- Less/clean/reusable packaging
- Energy-efficient transport mode
- Energy-efficient logistics

Life cycle stage 1: Production and supply of materials and components

What problems arise in the production and supply of materials and components?

- How much, and what types of plastic and rubber are used?
- How much, and what types of additives are used?
- How much, and what types of metals are used?
- How much, and what other types of materials (glass, ceramics, etc.) are used?
- How much, and which type of surface treatment is used?
- What is the environmental profile of the components?
- How much energy is required to transport the components and materials?

EcoDesign Strategy 1: Selection of low-impact materials

- Clean materials
- Renewable materials
- Low energy content materials
- Recycled materials
- Recyclable materials

EcoDesign Strategy 2: Reduction of material usage

- Reduction in weight
- Reduction in (transport) volume

Life cycle stage 4: Utilisation

What problems arise when using, operating, servicing and repairing the product?

- How much, and what type of energy is required, direct or indirect?
- How much, and what kind of consumables are needed?
- What is the technical lifetime?
- How much maintenance and repairs are needed?
- What and how much auxiliary materials and energy are required for operating, servicing and repair?
- Can the product be disassembled by a layman?
- Are those parts often requiring replacement detachable?
- What is the aesthetic lifetime of the product?

EcoDesign Strategy 5: Reduction of impact in the used stage

- Low energy consumption
- Clean energy source
- Few consumables
- Clean consumables
- No wastage of energy or consumables

EcoDesign Strategy 6: Optimisation of initial lifetime

- Reliability and durability
- Easy maintenance and repair
- Modular product structure
- Classic Design
- Strong product-user relation

Life cycle stage 2: In-house production

What problems can arise in the production process in your own company?

- How many, and what types of production processes are used? (including connections, surface treatments, printing and labeling)
- How much, and what types of auxiliary materials are needed?
- How high is the energy consumption?
- How much waste is generated?
- How many products don't meet the required quality norms?

EcoDesign Strategy 3: Optimisation of production techniques

- Alternative production techniques
- Fewer production steps
- Low/clean energy consumption
- Less production waste
- Few/clean production consumables

Life cycle stage 5: Recovery and disposal

What problems arise in the recovery and disposal of the product?

- How is the product currently disposed of?
- Are components or materials being reused?
- What components could be reused?
- Can the components be reassembled without damage?
- What materials are recyclable?
- Are the materials identifiable
- Can they be detached quickly?
- Are any incompatible inks, surface treatments or stickers used?
- Are any hazardous components easily detachable?
- Do problems occur while incinerating non-reusable product parts?

EcoDesign Strategy 7: Optimisation of the end-of-life system

- Reuse of product (components)
- Remanufacturing/refurbishing
- Recycling of materials
- Safe incineration

fig. 2.4 The EcoDesign Checklist (Brezet, 1997)