

# EcoDesign Audit

The strategic tool  
for circular  
business development

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# Contents

- 6 Introduction**
- 8 Why EcoDesign Audit?**
- 9 What is it? Who is it for?**
- 10 Outcomes**
- 13 EcoDesign Audit – how?**
- 13 Phase 1. Preparatory work**
- 14 Phase 2. Performing the assessments**
- 15 A. Organizational design capacity assessment**
- 17 B. Circular design assessment**
- 20 Phase 3. Reporting results**
- 22 The auditor**
- 22 Confidentiality**
- 23 Afterword**
- 24 Appendix 1. List of background information**
- 25 Appendix 2. Capacity assessment template**
- 28 Appendix 3. Circular design assessment template**

# Introduction

This handbook has been created to introduce the EcoDesign methodological guidance material (EcoDesign Audit).

To improve eco-innovation and eco-design performance organizations have to have a clear understanding of both their current and potential innovation and design capability as well as suitable eco-design strategies and practices. Although the eco-design should be a part of the organization's overall design process and business strategy to maintain and improve their products and services, it is still not easily measured and managed with traditional methods. Therefore, there is a need for a systematic assessment approach to drive improvement of the eco-design process.

There are no universal standards for carrying out an audit that covers different ecodesign/circular design aspects in the organization. The current EcoDesign Audit methodology is based on knowledge and experiences of previous similar initiatives of Estonian Design Centre and

Sustainable Design Lab in coaching companies in the design support programs.<sup>1</sup> Additional insight was brought from several other circular design guidelines. For example the circular design assessment method relies largely on the elements of Circular Economy Toolkit developed by the University of Cambridge.<sup>2</sup>

EcoDesign Audit is meant for small and medium size organizations (SMEs). It should be carried out by an auditor (external consultant or design manager) who has to follow recommended assessment steps in order to successfully gain a reliable, validated and integrated overview that encompasses the appropriate aspects and ends up providing clear recommendations in form of a report.

The audit recommendations will help the organizations to establish the basis for moving forward with product and

business development. They may be further developed and implemented with EcoDesign Sprint.

EcoDesign Audit has been developed by Sustainable Design Lab (SDL) of Estonian Academy of Arts as a part of the project "EcoDesign

Circle: EcoDesign as a driver of innovation in the Baltic Sea Region", partly funded by European Union Interreg Baltic Sea Region (BSR) program. It aims to increase the awareness of eco-design among the region's SMEs, design organizations and designers.

1 Circular design projects in Sustainable Design Lab (EKA) (see also <http://www.artun.ee/en/research-and-development/innolabs/news/>) Estonian Design Centre strategic design support program Design Bulldozer (see also <https://disainikeskus.ee/et>, <http://www.designforeurope.eu/case-study/design-bulldozer>)

2 See also <http://circulareconomytoolkit.org>

# Why EcoDesign Audit?

All organizational systems should support innovation and design. Corporate managers often need an external assistance and means of auditing their organization's innovation capacity and mapping suitable eco-design approaches, especially when it comes to relatively new concept of circular design.

The EcoDesign Audit helps

- The organization to identify its design capability and performance. It provides an indication of what the organization needs to integrate the sustainability, design and circular economy related improvements into its business strategy and product development process.
- The organization to understand the eco-design and specifically the circular design concept as well as identify the possible circular design opportunities/approaches that can be used as a basis for further product/service development process/project.

As such, the assessment is fast and is of great benefit in explaining also the circular economy as well as circular design concept, look at it from the organization's perspective and disseminating the insight amongst the employees.

# What is it? Who is it for?

The aim of the EcoDesign Audit is to evaluate the design capacity and possible design approaches of organizations to integrate the design and circular economy related aspects into their product development process.

EcoDesign Audit is a diagnostic tool

1. To evaluate and map the existing strategy, organizational structure, processes and relevant design management aspects of the organization to identify the major needs, possible weaknesses and strengths.
2. To identify relative opportunities and possible design approaches to the product and service development from the eco-design/circular design perspective.

The audit is a step-wise process of assessment and analysis, which leads to recommendations for the improvement of design capacity and possible design approaches in the transition towards a circular economy model. This overview helps to understand the opportunities for improvement and untapped potential for the organization, may it be eco-design, circular business models or the development of new sustainable products/services.

EcoDesign Audit

- Can help any company or organization to analyze its current design capacity, strategy, practices and product development approaches.
- Is especially suitable for SMEs, because often they lack knowledge and resources to specialize on eco-innovation and to seek out appropriate eco/circular design solutions.
- Is more suitable for already existing organizations, since the methodological approach focuses on the assessment of existing design management practices as well as existing products and services.

For the best results, the organization should have the following characteristics:

- Real desire and motivation to eco-innovate and improve the environmental performance of its products or services.
- Existence of at least a minimum capacity, internal organisation and resources to enable the organisation to carry out an eco-design project.

# Outcomes

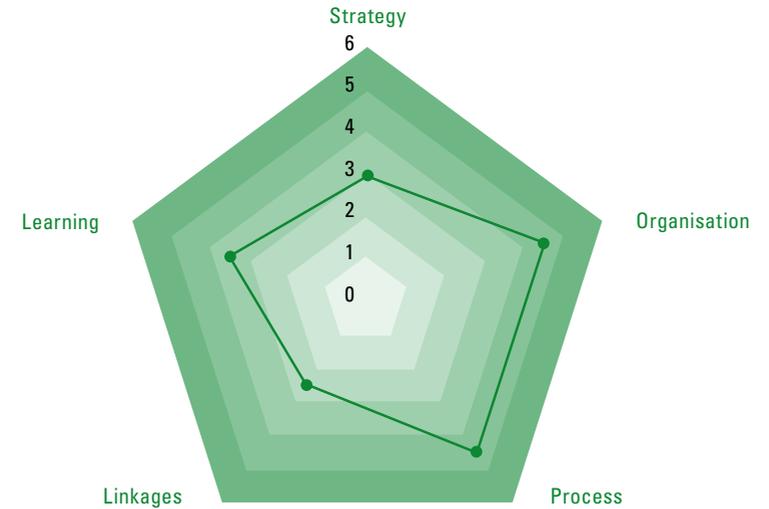
The benefits for the participating organization:

- The audit reviews current design strategy and practices of an organization. The external consultant is able to advise on alternative and additional measures and techniques that organizations can adopt to improve and maximize their innovation and design capacities.
- It enhances the organization’s design capability as well as identifies opportunities for eco-design based on circular economy.

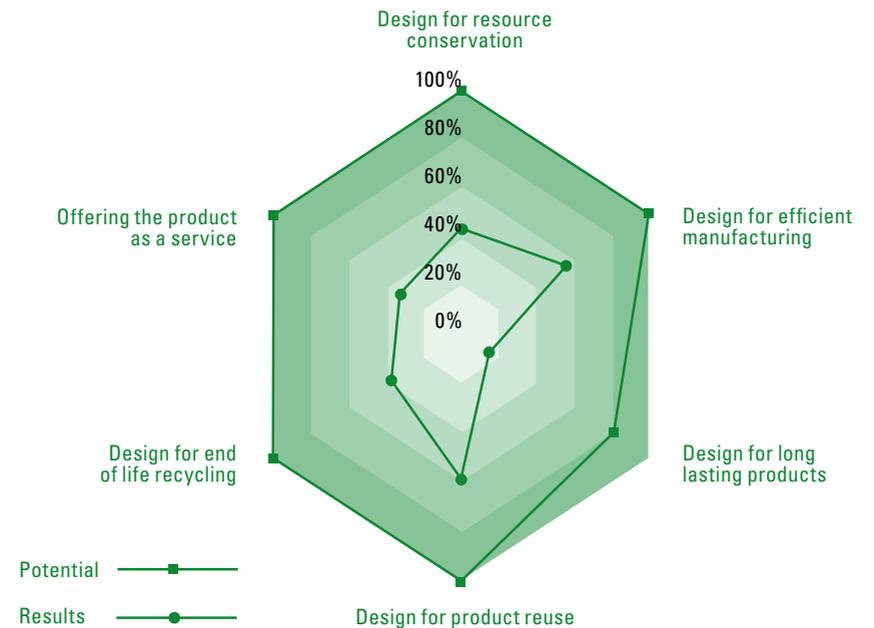
The outcomes of the EcoDesign Audit are presented to the organization in a documented report. The results can also be presented in a visual manner (diamond graph), that allows to show of what organization is lacking and what are areas that need to be improved.

The report provides a foundation to assess the business potential of every circular improvement within its given context and organizational setting.

## Organisational Capacity Assessment Results



## Circular Design Assessment Results





# EcoDesign Audit – how?

Technique and more specific approach of the EcoDesign Audit process can vary depending on the particularities of the organization, its size, activities as well as the overall aim and needs of the audit.

The EcoDesign Audit consists of three phases:

1. Preparatory work
2. Performing the assessments
  - 2.1 Design Capacity Assessment
  - 2.2 Circular Design Assessment
3. Report

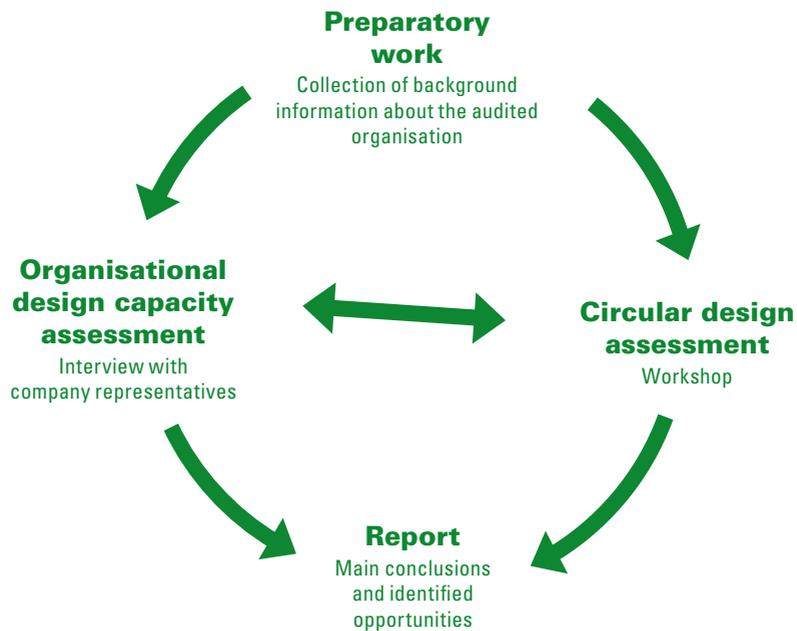
Usually the audit is a combination of short site visit, interview(s) (design capacity assessment) and a workshop (circular design assessment). The main focus and scope of the audit is agreed together with the audited organization prior to the audit and on average will take approximately 5 days to complete from initial scoping, performing assessments and completion of a draft report.

## Phase 1. Preparatory work

The objective:

1. To collect the basic information about the audited organization and its activities (e.g. its products and services, financial performance and organizational structure) and additional information on design management, competitive position, supplier and customer relationships.
2. To prepare the audit plan (time schedule, involved personnel, logistics, meetings/workshop facilitation arrangements) is also prepared and agreed with audited organization.

During the preparatory work, the auditor should get acquainted to sector specific developments and relevant circular design opportunities. Proper preparation ensures that the auditor selects the most appropriate approach that helps to reach the audit objectives the best.



**Figure 1.** Structure of EcoDesign Audit

The relevant background information helps

- To understand the organization, its opportunities and constraints when dealing with (eco/circular) design.
- To define better the audit process and prepare for the assessments (e.g. develop and customize the questionnaire and prepare the workshop).

The background information can be collected based on the list of questions/data (see Appendix 1). This list can be sent to the relevant organization personnel for completion.

## Phase 2. Performing the assessments

Main data collection and analysis is carried out in the form of two separate assessments:

1. Organizational design capacity assessment
2. Circular design opportunity assessment

### A. Organizational design capacity assessment

The objective of the capacity assessment is to discover the (eco/circular) design capacity<sup>1</sup> of the organization – it determines the current design management processes and practices, strengths and weaknesses of the organization's and identifies ways to improve product design practice throughout the organization.

During this assessment, a number of factors or dimensions<sup>2</sup> that shape the organization's innovation and (eco/circular) design capacity will be analyzed:

#### Strategy

The assessment looks at the following major areas:

- Whether the organization has a strategy and well-managed strategic planning process in place that supports eco-design.
- Whether innovation and design is appreciated by entire organization.
- Whether the organization has put in place mechanisms that effectively implement the organization's strategy and values.

#### Organization

The following areas should be examined:

- Does the organizational structure encourage, rather than stifle, innovation and design through effective top-down, bottom-up, and lateral communication and coordination within the organization.
- Does management have put in place a system that encourages employees to bring forth new ideas.
- Are the roles and responsibilities regarding the design process clearly defined.

#### Process

This dimension examines the existence, robustness and flexibility of the organization's product development process. In addition, the assessment looks at the organization's ability to manage its internal product design processes.

<sup>1</sup> Design capacity is defined as an organization's proficiency to gather, assimilate and implement knowledge about design. Eco/circular design is integral part of an overall design and business strategy of an organization.

<sup>2</sup> The innovation and design capacity assessment framework is based on so-called Innovation Diamond model proposed by Tidd, Bessant and Pavitt (Managing Innovation. 3rd ed. John Wiley & sons, Ltd, 2005) that is widely used for measuring the innovation and product development capability of organisations.

## Linkages

This dimension examines the organization's ability to cooperate and create relationships with external entities (such as customers, suppliers, research institutions, consultancies, business partners, etc). More specifically, it examines the potential of these links to provide knowledge/information to the organization. The close cooperation with possible partners is especially relevant in implementing successful circular business models.

## Learning

The assessment:

- Tries to gauge the organization's commitment to the training and development of its employees.
- Examines the organization's ability to gather knowledge/information from its linkages and other external factors (e.g legal, economical, socio-cultural, technological developments) that can influence the organization's business.
- Takes a look at the organization's ability to learn from its successes and failures.
- Examines the firm's ability to share these learnings to the entire organization.

The auditor can use also other frameworks or models to assess the innovation and (eco/circular) design capacity of the organization.

Each of the above mentioned dimensions are measured by a set of questions to evaluate and assess the organization performance along the corresponding dimension (see also Appendix 2. Capacity assessment template).

The auditor should assign a score to each of the question to define the performance level for every dimension that thus helps to define the overall profile of the organization's innovation and (eco/circular) design management.

The necessary information for the evaluation is collected during the initial phase and during a short interview (1-3 hours) with top manager or other key people of the organization.

It is up to auditor to choose a technique for documenting the results of the interview, based on his/her experience. It is recommended to prepare

a checklist of issues or more specific questions (relevant to the audited organization) that can be used as a basis for interviews. This helps to evaluate more systematically the level (and assign score for defined questions in the attached assessment template) of organization's performance under each evaluated dimension. It is recommended to summarize the evaluation/assessment result under each scoring question with a short comment/conclusion. This helps to prepare the audit report in the later stage.

## B. Circular design assessment

The objective of the circular design assessment is to identify potential opportunities or approaches for improvement of product/service and business model of audited organization according to circular economy principles.

The circular design assessment is based on Ecodesign Strategy Wheel concept that is adapted to the context of the circular economy. It describes the range of circular design approaches that organizations can use to develop their products and business models. The circular design

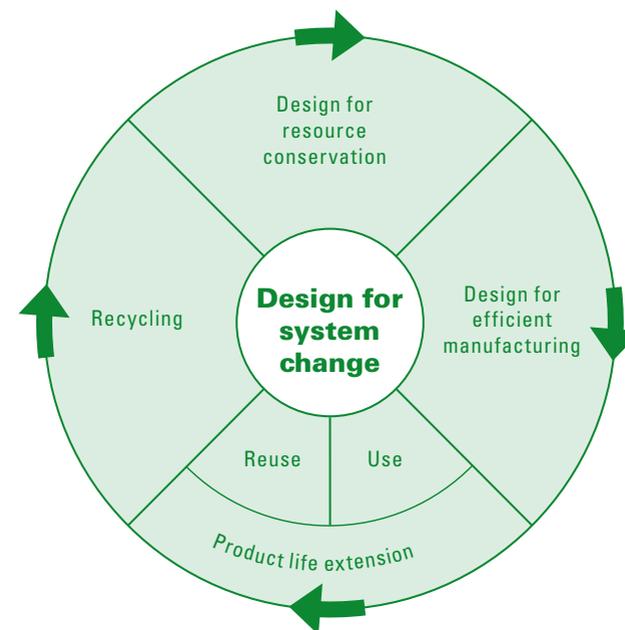


Figure 2. Circular design approaches

approaches are presented in categories related to product life cycle stages starting with product design that takes into account the material considerations or resource conservation aspects and followed by typical product circular life cycle based stages – manufacturing, product use and end of life stage.

In addition, design for system change (more specifically product as a service model) is included to the assessment (see Figure 2 and Table 1).

The circular design assessment is carried out in the form of a 3-hour workshop.

It's important that all key employees whose work is related to product development attend the workshop.

The workshop usually covers the following issues:

- Introduction to the circular economy
- Overview of circular design approaches/opportunities and related circular business models
- In-depth opportunities discussion and evaluation of their potential regarding to organization context (based on attached assessment checklist)
- Summary and next steps

The auditor facilitates the discussion and evaluation based on circular design assessment checklist that follows the above-mentioned set of circular design approaches (see Appendix 3). The checklist is a list of aspects that provide support for the analysis and evaluation of organization's potential in implementing different circular design approaches. The assessment provides an indicator of potential areas of improvement of product circular design aspects and related business opportunities.

The circular design assessment checklist is filled by the auditor, based on the discussion with workshop participants. Each aspect of each circular design opportunity/approach category is assessed on the scale of low-to-high by marking an "x" to any of the five positions. The results are provided as a percentage of circular progress is given, subjective to the participants' opinion. 0% means no circular opportunities exist or are implemented so far and 100% means all circular opportunities have been used exhaustively.

**Table 1.** Categorisation of circular design approaches

Product material and composition related design	Product manufacturing	Product life extension		Product/ material recycling	Design for system change
		Design for long lasting products	Design for product reuse		
Design for resource conversation	Design for efficient manufacturing	Design for long lasting products	Design for product reuse	Design for end of life recycling	Offering the product as a service
Reduced and optimised materials in product	Preventing and minimising waste production	Product durability	Design for products to be reusable as is	Design for end of life product disassembly for material recovery	Pay per service unit – offering the services of a product
Considered choice of materials (e.g. recycled materials, recyclable materials, non-hazardous materials, local materials)	Finding use to manufacturing waste and by-products	Ease of maintenance and repair for product durability in use	Design for ease of repair and refurbish for reuse	Design for end of life collection and transportation	Product renting – offering access to the product
Reduced spectrum of materials	Energy efficiency	Product up-gradability and adaptability – e.g. modularity, standardized components, customization etc			
Packaging design – material use and recyclability, packaging functionality/ optimality etc	Use of renewable energy				

Based on the results of the discussion and evaluation the facilitator creates summary that will be presented in the audit report.

### Phase 3. Reporting results

The outcomes of the EcoDesign Audit are presented to the organization in a documented report. The initial results with main conclusions and identified opportunities will be presented to and discussed with company manager(s) before preparing the final report. This is advised because it is very likely that company managers will have a deeper insight into certain findings. The final report will be then presented to the company.

It is often valuable to organize a special seminar to present and discuss the results of the audit and agree upon the possible further activities related to a possible product development project.

The report provides a foundation to assess the business potential of each and every circular improvement within its given context and organizational setting.



# The auditor

The EcoDesign Audit is carried out by an external consultant(s) (design managers or experts) in close cooperation with the management and personnel of the examined organization.

Whether it is a single consultant/design manager or a group of experts depends on the size and complexity of the examined organization.

The auditor

- Should be a qualified expert capable of performing analysis and diagnosis, having previous experiences in the field and extensive knowledge related to design practices and product development problems in SMEs.
- Should have:
  - Substantial experience in working with, auditing or consulting in innovation and design with several companies.
  - Understanding of the audited business sector.
  - Knowledge of the sustainability, environmental and circular design issues.
  - Knowledge of the auditing technique and familiar with the EcoDesign Audit methodology through a training course.
- Psychological awareness and a range of soft skills around interaction with company representatives and managers.

The most important items needed for a successful audit are cooperation and good communication between the auditor and the client.

# Confidentiality

Throughout the audit period and beyond, confidentiality on the part of the auditor (all participating consultants and experts) must be assured since many sensitive areas of the organization's operations would be covered. It is highly recommended to sign a confidentiality agreement between the audited organization and the auditor(s) prior to starting the audit process.

# Afterword

The objective of EcoDesign Audit is to become a strategic tool in developing the organization's business operations.

The EcoDesign Audit method has been developed with great people and companies. Special thanks to Sustainable Design Lab (SDL) of Estonian Academy of Arts, Anne Raudaskoski from Ethica Oy and all the companies who carried out the pilot audits! Our warmest thanks also to Design Forum Finland and Swedish Industrial Design Foundation who helped us to run pilots in Finland and Sweden.

## Appendix 1. List of background information

Number of employees	
Turnover/business growth (last 5 years)	
Net profit	
Main (economic) activities (NACE)	
Main products/services	
Main clients/customer groups	
Main markets	
The share of own products/services (developed by the company itself)	None %
The proportion/share of new products developed or improved during the last five years	None %
What is the uncertainty level related to designed products/services?	◦ Low (use of known and proven approaches/technologies)
	◦ Average (integration of innovations leading to some unknowns)
	◦ High (very innovative and creative projects/products/services)
	◦ Does not apply
Product design/development budget (euro/year)	
Usual size of a design team assigned to a Project	No one Number
What are the important past problems the organisation has had with customers, products, personnel, etc?	

## Appendix 2. Capacity assessment template

Strategy					Comments
	Assessed factor	YES	PARTLY	NO	
1	Does the organisation understand the benefits of innovation and (eco)design?				
2	Is the innovation/design incorporated to organisation's strategy or strategic planning process?				
3	Are the sustainability/environmental issues integrated to organisation's strategy?				
4	Does the organisation have a well-managed strategic planning process that support the (eco)design (including clear objectives and planned activities)?				
5	Is the innovation/design strategy known and understood through the organisation?				
6	Are the strategic goals and targets monitored regularly?				
Organisation					Comments
	Assessed factor	YES	PARTLY	NO	
1	Does the organisational structure support innovation and product development/design?				
2	Is the top management committed (provide appropriate leadership) and ready to provide necessary resources for the innovation and product development process?				
3	Are the roles and responsibilities clearly defined?				
4	Does the organisation have sufficient internal capacity and skills for product development (incl. ecodesign)?				
5	Do people work together in mixed role teams (practice to create 'project teams')?				
6	Is there a reward and recognition system that supports innovation and product development?				

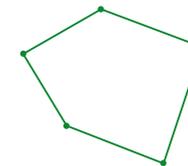
Process					Comments
	Assessed factor	YES	PARTLY	NO	
1	Does the organisation have standardised work processes established, implemented and maintained?				
2	Is the product development process well designed and managed?				
3	Are project management capabilities well developed?				
4	Does the organisation have well functioning internal and external communication (marketing) system in place?				
5	Does everyone (not just marketing) understand customer needs?				
6	Does the organisation have sufficient infrastructure and technology in place?				
Linkages					Comments
	Assessed factor	YES	PARTLY	NO	
1	Does the organisation have means in place to disseminate information and generate support (use of networks, social platforms, other communication means)?				
2	Does the organisation have maintained a reliable source of new knowledge (e.g cooperation with consultants/experts, universities or research centres)?				
3	Does the organisation maintain (win-win) relationships with its suppliers?				
4	Does the organisation have developed networks to engage the individuals or groups they are working to serve?				
5	Does the organisation participate in the work of sectorial/professional organisations (unions, clusters, associations, etc)?				
6	Does the organisation benchmark against the competitors?				

Learning					Comments
	Assessed factor	YES	PARTLY	NO	
1	Does the organisation have performance targets in place across activities?				
2	Does the organisation have metrics that help in diagnosing its innovation/design management activities?				
3	Does the organisation have a feedback and learning (e.g learning from past mistakes and success) system in the place?				
4	Does the organisation have a procedure to identify and analyse the main external risk and opportunities (e.g legal, economical, socio-cultural, technological developments)?				
5	Is there an effective market/customer feedback mechanism in place?				
6	Are the learnings shared to the entire (relevant people) organisation?				

YES - 1 point; PARTLY - 0,5 point; NO - 0 point

### Example: Organisational Capacity Assessment Results

Strategy	
Organisation	
Process	
Linkages	
Learning	



	Has potential? Mark: Y/N	If yes, assess your performance by marking "x"							Max potential at	Current circular progress	Comment
<b>Product materials and composition</b>									50%	44%	
Design for resource conservation											
Material use	Y	low	x					high			
Use of recycled materials	Y	low			x			high			
Use of recyclable materials	Y	low					x	high			
Use of eco-efficient materials	Y	low					x	high			
Use of locally sourced materials	N	low						high			
Contains harmful substances	N	low						high			
Spectrum of materials used	N	low						high			
Packaging	N	low						high			
<b>Product manufacturing</b>									50%	38%	
Design for efficient manufacturing											
Production waste created	Y	low	x					high			
Value of waste found in- and outside the company	N	low						high			
Energy efficiency in production	N	low						high			
Use of renewable energy	Y	low			x			high			
<b>Product life extension</b>									60%	45%	
Design for long lasting products											
Product durability - expected life span of the product	Y	low					x	high			
Ease of maintenance for user	Y	low		x				high			
Ease of repair for user	N	low						high			
Product's warranty	N	low						high			
Product upgradability and adaptability	Y	low					x	high			

<b>Design for product reuse</b>									100%	75%	
Product's reuse potential	Y	low		x				high			
Product's reuse or second hand retail	Y	low					x	high			
Ease of repair and refurbish for reuse	Y	low					x	high			
<b>Material recycling</b>									100%	100%	
Design for end of life recycling											
Product & material collection after use	Y	low					x	high			
Ease of separating materials	Y	low					x	high			
<b>Design for system change</b>									100%	100%	
Offering the product as a service											
Products' use intensity	Y	low					x	high			
Number of customers paying per service unit	Y	low					x	high			
Number of products rented	Y	low					x	high			
<b>OVERALL</b>									<b>68%</b>	<b>58%</b>	

### Circular Design Assessment Results

Current circular progress	
Design for resource conservation	44%
Design for efficient manufacturing	38%
Design for long lasting products	45%
Design for product reuse	75%
Design for end of life recycling	100%
Offering the product as a service	100%

Max potential	
Design for resource conservation	50%
Design for efficient manufacturing	50%
Design for long lasting products	60%
Design for product reuse	100%
Design for end of life recycling	100%
Offering the product as a service	100%

## Are you interested in EcoDesign Audit?

You can find more information here: [www.disainikeskus.ee](http://www.disainikeskus.ee)

You can also email us: [info@disainikeskus.ee](mailto:info@disainikeskus.ee)

More information of EcoDesign Circle: [www.ecodesigncircle.eu](http://www.ecodesigncircle.eu)

**Estonian Design Centre** fosters and connects the players in the field of design. Our aim is to make design more visible in our society, to increase design awareness and promote the use of design as a strategic tool for solving big societal challenges, growing the economy, increasing innovation and improving the quality of everyday life.

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