

# Learning Factory for EcoDesign

## What is eco-design?

Eco-design is a systematic and comprehensive creative approach to products and services, employing improved product and service-design to minimise their environmental impact across the entire lifecycle. During product planning and design, producers can greatly influence any phase of the value creation process and material lifecycle – a chance to promote ecological innovation.

## What is Learning Factory for EcoDesign?

In general, a learning factory provides a real production environment for a physical product in which participants can perform, evaluate, and reflect their own actions in an on-site learning approach<sup>i</sup>. The Learning Factory for EcoDesign combines a real manufacturing environment and a creative eco-design process including the latest design and environmental assessment tools and methods. The goal is to create a virtual and physical space in which product designers and engineers can experience throughout the product development process the impacts of design decisions on the environmental footprint of their products and services. Green products and business models start with the design!

## Who is the project team?

The project team consists of experts on eco-design from Fraunhofer Institute IZM<sup>ii</sup> in Germany (Dr. Max Marwede, Scientific Coordinator and Project Manager) and experts on design methods and circular business models from Circular Devices<sup>iii</sup> in Finland (Tapani Jokinen, Chief Design Officer), the company behind the PuzzlePhone and PuzzleLab concepts. The project is commissioned and actively supported by specialists on eco-design from the German Environment Agency (UBA)<sup>iv</sup>.

## Who is the audience of the Learning Factory for EcoDesign?

Product designers and developers, engineers, teachers, start-ups, business model developers – in general, actors who are interested to learn and adopt eco-design tools and methods.

## Who is funding the Learning Factory for Eco-Design?

The project is part of the EU-project EcoDesign Circle<sup>v</sup> supported by the Interreg Baltic Sea Region Programme<sup>vi</sup> and coordinated by the German Environment Agency (UBA). The project is conducted on behalf of UBA (environmental research plan – project code number 3715 37 309 0) and is funded by the Federal Republic of Germany.

## More Questions? Get in contact with us.

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## The concept in detail

The goal of the project is to develop a concept for the Learning Factory for EcoDesign, which consists of

1. a **real manufacturing environment** for electronics, where eco-design tools for product-development (e.g. eco-design guidelines, simplified life-cycle-assessment tools, material catalogues) as well as manufacturing and testing equipment for mini-series and prototypes will be available to support the design, development and manufacturing of sustainable products. Electronic devices are seen as a highly suitable to understand eco-design principles and to explore the whole eco-design process.
2. a **creative and analytical eco-design process** regardless of the product group. For each phase of the eco-design process, tools and methods shall be provided:
  - Eco-design guidelines based on the principles durability, reparability, substitution of material, material and energy efficiency, prolonging lifetime, circularity etc.
  - Analytical tools (e.g. simplified life-cycle-assessment, material flow analysis, life cycle costing)
  - Information on sustainable technical solutions and regulatory requirements
3. general **teaching material** for practitioners and teachers from design and engineering containing the basics and practical methods how to eco-design. The material will contain:
  - User-centric and co-creation design methods for product design and development
  - Relevant eco-design principles, methods and tools, which can be used during the eco-design process
  - Sources and information for sustainable technical solutions and regulatory requirements

Furthermore, a pilot will be conducted in order to verify the developed concept of the Learning Factory for EcoDesign. The pilot will consist of an **e-learning seminar** and a creative and participative **eco-design workshop**. The e-learning seminar (e.g. webinar) will explain the eco-design process and present (selected) methods, tools and information. During the eco-design workshop, the participants will develop a simple mockup in an “abbreviated” eco-design process going through some of the product development phases. During the workshop, the participants will use and apply different eco-design tools. Furthermore, environmental impacts of design decisions during the life cycle (manufacturing, use, end of life) will be visualized in the **real manufacturing environment** or at **product examples**.

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<sup>i</sup> [Abele et al. \(2015\), Learning Factories for research, education, and training. Procedia CIRP 32: 1–6.](#)

<sup>ii</sup> Fraunhofer IZM <http://www.izm.fraunhofer.de/en.html>

<sup>iii</sup> PuzzlePhone <http://www.puzzlephone.com/>

<sup>iv</sup> German Environment Agency <https://www.umweltbundesamt.de/en>

<sup>v</sup> EcoDesign Circle project: <http://www.ecodesigncircle.eu/>

<sup>vi</sup> EU Interreg Baltic Sea Region programme: <https://www.interreg-baltic.eu/>