MAPPING THE ENVIRONMENTAL IMPACT OF THE LIFE CYCLE OF PRODUCTS FROM THE DESIGN PHASE

The **design phase is of crucial importance** to reduce the environmental impact of a product. It is in this phase that action can be taken in an efficient and effective way to reduce the environmental impact of a product in the different phases of its life cycle.

Efficient use of materials, recyclability and socially responsible solutions are just as important for tomorrow's designers as functionality and aesthetics. Products, services, systems and circuits are being designed to bring economic, social and environmental added value. They respond to the needs of everyone, now and in the future, without exceeding the capacity of the planet.

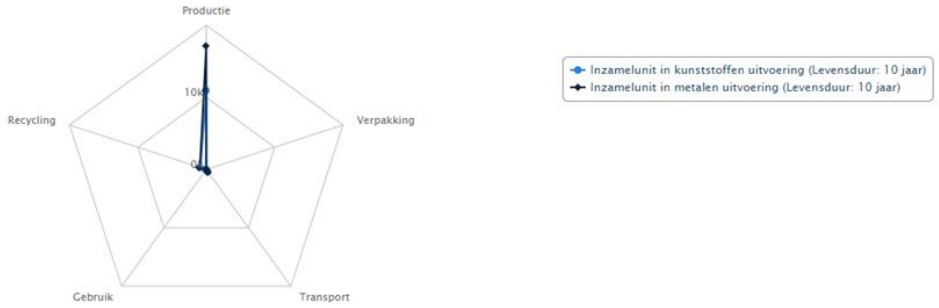
OVAM developed the **Ecolizer** design tool (see 'Sources' for more information) to map the environmental impact of products over their entire life cycle. The Ecolizer is an ecodesign design tool and is aimed at all designers and companies who want to know and tackle the environmental impact of their products.

DESIGN PRODUCTS WITH MINIMAL ENVIRONMENTAL IMPACT OVER THEIR ENTIRE LIFE CYCLE

The Ecolizer allows you to calculate the environmental impact of your product quickly and easily. You can calculate the total environmental impact as well as the impact per phase in the life cycle of a product. This allows you to tackle a life cycle phase with a high environmental impact in a targeted manner.

As an example, in the figure below the environmental impact of a collection unit was calculated for 2 versions (a metal and a plastic version). This collection unit was designed for the collection of waste batteries (at the request of Bebat) and for the collection of waste electrical and electronic equipment (at the request of Recupel).

The environmental impact, over a lifetime of 10 years, is highest for the metal collection unit (highest score of 18,566 millipoints). The difference lies mainly in the production phase, where the metal collection unit has a significantly higher environmental impact.



Ontwerp	Productie	Verpakking	Transport	Processing	Recycling	Totaal
Inzamelunit in kunststoffen uitvoering	10966.89	0	389.84	13.8	841.56	12212.09
Inzamelunit in metalen uitvoering	17151.19	0	472.78	13.8	928.56	18566.33

Environmental impact of a collection unit in plastic versus in metal - Ecoscore in mPpt. Source: Ecolizer

ENVIRONMENTAL IMPACT OF USE PHASE IS DOMINANT FOR PRODUCTS WITH HIGH ENERGY CONSUMPTION

In the Ecolizer, the recessed spotlight with **LED bulbs** is compared with the same recessed spotlight, but with **halogen bulbs**, over the same period of 25 years. The environmental impact of the use phase ('processing' in the table below) is dominant in both cases due to the **energy consumption** of the recessed spotlight. Despite the high score for the production of the electronic power supply component in the LED light, the LED version scores much better due to reduced energy consumption. Reduced energy consumption therefore benefits not only the consumer's portfolio, but also the environment.

Ontwerp	Productie	Verpakking	Transport	Processing	Recycling	Totaal
Inbouwspot met LED	6894.85	40.05	1500.77	11900	20.56	20356.23
Inbouwspot met halogeenlamp	448.85	40.05	373.25	59575	11.85	60449

Environmental impact of a recessed spotlight with LED versus halogen bulb - Ecoscore in mPpt. Source: Ecolizer

WANT TO KNOW MORE?

There are many **labels** that indicate the **sustainability** (by sustainability we do not mean the durability or lifespan, but the environmental impact) of a product. For example, the European Ecolabel is awarded to products and services that meet specific environmental criteria. Another example is the cradle-to-cradle label (C2C-label) for products that are environmentally friendly, designed on the basis of natural principles and fit circularly into technical or natural cycles.

At European level, the **Ecodesign Directive** (2009/125/EC) sets requirements for the ecodesign of energy-related products. Rules for different product groups have been established on the basis of product studies. The environmental profile for each product group is determined in order to arrive at specific environmental criteria. These are products that are sold frequently and that have a major impact on the environment. The European Commission is currently working on the extension of the Ecodesign Directive: in addition to energy efficiency, all environmental aspects of a product (composition, durability, disassembly, repairability and reusability) must be taken into account.

SOURCES

The **Ecolizer** (www.ecolizer.be) is a tool that makes environmentally responsible product design more accessible. The different processes, materials, packaging, modes of transport necessary for the manufacture and use of the product are summarised in a single comparable figure. Through the Ecolizer, the user tries to keep this Ecoscore, which reflects the environmental impact, as low as possible.

The data in the Ecolizer are based on the ecoinvent database. This database is one of the most extensive international LCA databases. The Ecolizer calculates the environmental impact of a product on the basis of a number of environmental impact categories, including ozone depletion, acidification, eutrophication, human and ecotoxicity, land and water use, depletion of raw materials, etc. The reason for working with different environmental impact categories is to avoid 'passing on' the environmental impact to other categories. Passing on can occur if only one or several categories are included in a score. After all, a product can score well in category A and badly in category B. For very limited categories, where only category A is shown, this may give a distorted picture. By including as many categories as possible, outliers will be included and passing on is difficult. The different environmental impact categories are reduced to a single accessible score by means of weighting. This Ecoscore is expressed in eco-indicator points, one eco-indicator point corresponds to one thousandth of the total annual environmental impact of an average European. The unit used in the Ecolizer is one millipoint (mPpt) and thus corresponds to one millionth of this load. In addition to the individual analysis of a product, different material and product alternatives can also be compared with each other.

OVAM Ecodesign.link (www.ecodesignlink.be) is the meeting point for all those who are active in sustainable product innovation. It brings together the OVAM tools (such as the Ecolizer) in a visible and accessible way and aims to position OVAM as a cooperation partner for all actors in the life cycle of products.