

## Environmental and cost analysis based on the life cycle (LCA / LCC) of products, processes and services

An environmental management tool applicable to Ecodesign, Ecolabelling, Carbon Footprint Calculation, and decision making



The challenge of dealing with major environmental problems such as global warming, which affects the whole planet, can be mitigated thanks to the LCA / LCC studies, which allow us to progress in their sustainable development by calculating the environmental and cost impacts potentials associated with a product, process or service, covering the entire life cycle.

The Life Cycle Analysis (LCA) is a tool that allows identifying the potential environmental impacts of a product, process or service by quantifying the emissions generated and the consumption of raw materials and energy associated with all stages of the production process, what supposes a perspective of analysis "from the cradle to the grave". In addition, the LCA can be extended to perform the cost analysis (LCC) under the same perspective. Its holistic characteristic gives an objective, methodical, systematic and scientific vision for the calculation of said impacts, which makes it a useful tool to promote the sustainable development of companies and their interrelation with their clients.

### ¿Why adopt a LCA approach?

#### CORPORATE RESPONSIBILITY AND SUSTAINABILITY

- ✓ Reduction of quantifiable environmental impacts of processes / products / services or of the organization itself.
- ✓ Commitment of the company with the environment.
- ✓ Competitive advantage over competitors.

#### ENERGY, ECONOMIC AND ENVIRONMENTAL OPTIMIZATION

- ✓ Achieve a more efficient production and more respectful with the environment.
- ✓ Design and improvement of products, comparing the impacts associated with the implementation of new materials or technologies with respect to other conventional ones.
- ✓ Strategic planning of improvement in the most critical points according to the LCA.
- ✓ Development of public policies.

*"The LCA evaluates all stages of the life cycle, quantifying the environmental impacts caused in each of them through the use of environmental indicators or ecoindicators".*



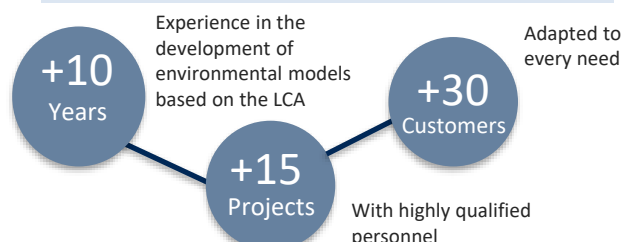
### Objectives of the service

- ✓ **Evaluate the impacts** in terms of environmental indicators, such as climate change, water footprint, acidification, ecotoxicity, etc.
- ✓ Calculate the **carbon footprint** of products, services and organizations (according to methodologies recognized as PAS 2050 or GHG Protocol).
- ✓ Advice on product **ecodesign strategies**.
- ✓ Advice on obtaining certificates, eco-labels, and / or Environmental Product Declarations (DAP / EPD).
- ✓ Strategies to **reduce emissions** and **support in making** strategic decisions and new implementations.
- ✓ **Economic evaluation** of the life cycle of a product or service considering direct costs and indirect costs such as environmental externalities.

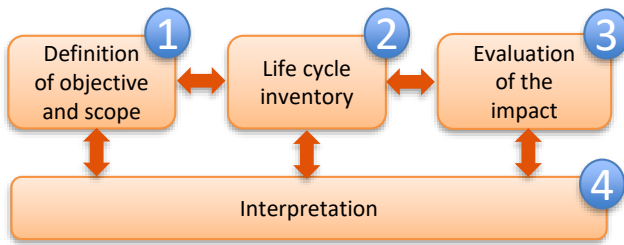
#### Focused on

*Companies, organizations, industrial plants, services, offices and public administrations that wish to know the environmental impact associated with their activities, as well as being able to optimize their production processes.*

#### Key Figures



## Methodology



Based in the family of norms ISO 14040

## Results



- Evaluation of the environmental impacts associated with the inputs and outputs identified and quantified in the **life cycle inventory**, which provides information to better understand the environmental behavior of the system under study.



- Valuation of advantages and disadvantages of each stage of the value chain in order to apply **environmental improvement strategies**, involving new modes of design, production and more sustainable consumption.



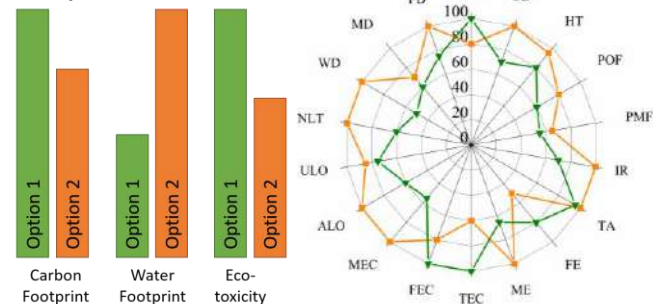
- Evaluation of the monetary flows of a product throughout its life cycle, which allows identifying **opportunities to reduce costs** from the design phase to its end of life.

### Analysis tools of LCA

- Use of software for the analysis of environmental impacts (SimaPro, OpenLCA).
- Use of extensive and contrasted databases, both own, generated thanks to the experience acquired, as well as internationally recognized public (ILCD / ELCD) and private (Ecoinvent).

The results obtained for the different ecoindicators are illustrated and evaluated in a report that describes the main environmental aspects identified throughout the life cycle for decision making in continuous improvement

### Comparison of alternatives



### Value contributed

- ✓ The LCA is a powerful tool to develop **business strategies** through a clearer communication with customers and other stakeholders.
- ✓ It helps the company to identify the **critical points** of its value chain from an environmental point of view in order to detect possible areas that could be improved..
- ✓ Greater transparency and access to information on those products and services for which they pay, which allows **responding to a growing demand from new consumers** who are environmentally aware.
- ✓ **It attracts new customers** willing to "buy green products" if the correct information is available.

## Work references

CIRCE has extensive experience in conducting environmental studies and life cycle analysis in both the private and public sectors.

**EFEVE** ( FP7. EC) Development of a new high performance material associated to a new technological Energetic, Flexible, Economical, Versatile and Ecological process to make super strong and lightweight components



**Circ-pack** (H2020. EC). Towards circular economy in the plastic packaging value chain.



**Vulkano** (H2020. EC). Novel integrated refurbishment solution as a key part towards creating eco-efficient and competitive furnaces.



**Polynspire** (H2020. EC). Demonstration of Innovative Technologies towards a more Efficient and Sustainable Plastic Recycling.



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