Rethink

Het initiatief waarbij we onze LCA’s maken.

Insights > Life cycle assessment

LIFE CYCLE ASSESSMENT

Life cycle assessment (LCA) is a methodological tool used to quantitatively analyze the life cycle of a product (both goods and services) within the context of environmental impact. In LCA, the total life cycle of a product or activity is considered, from the extraction of resource materials, production, transportation to the waste and waste treatment stage, also referred to as from the cradle to the grave. For this purpose, specific calculation tools are being applied

LCA is based on a set of international standards that define the principles, framework and requirements for conducting and reporting LCA studies.
The main ones are ISO 14040 and ISO 14044, which cover the four phases of LCA: (1) goal and scope definition, (2) inventory analysis, (3) impact assessment and (4) interpretation.

LCA’s key elements are (1) identify and quantify the environmental loads involved, e.g. the energy and raw materials consumed, the emissions and wastes generated (2) evaluate the potential environmental impacts of these loads and (3) assess the options available for reducing these environmental impacts.

Life Cycle Impact Assessment (LCIA) is the method for converting inventory data from a life cycle assessment into quantitative contributions to environmental impacts. This enables practitioners and decision makers to better understand the damage caused by resource and emissions.
Impact categories considered include climate change, ozone depletion, human toxicity (cancer and non-cancer), ecotoxicity, particulate matter, ionizing radiation, photochemical ozone formation, acidification, eutrophication (terrestrial, marine, and freshwater), land use, water use, and resource use.

CLASSIFICATION, CHARACTERIZATION AND WEIGHTING

The material and energy inputs and outputs are inventoried to the relevant impact category (the effect they have on the environment). All substances are then multiplied by a factor that reflect their relative contribution to the environmental impact, in other words, quantifying how much impact a product (both products and services) has in each impact category.

All LCA steps and assumptions made are described in an LCA background report. This report services as reporting and is also required during an independent review.

Weighting is an (optional) impact assessment step for better understanding the results and compare the different impact categories of an environmental footprint study. Weighting factors reflect the perceived relative importance of the environmental footprint impact categories considered. Weighted results for impact categories can then be compared to assess their relative importance (e.g. climate change more relevant than toxicity). Results can also be aggregated across environmental footprint impact categories to obtain several aggregated values or a single overall impact indicator.

An LCA gives a clear insight into the product's environmental impact and which components make the most significant contribution.

The result of an LCA study is an environmental profile of a product (both goods and services): a 'score list' with environmental effects. The environmental profile shows the most significant environmental problems caused by a product (both goods and services) and at which stage(s) in the life cycle these problems are caused. In this way, LCA contributes to identifying opportunities to improve the environmental performance of the product (both goods and services).Also, the consequences of different alternatives can be shown.

WHY THINKING ABOUT AN LCA?

A Life Cycle Assessment (LCA) provides businesses insights into a specific product's environmental impact identifies opportunities to answer the critical question **how to reduce the environmental impact of that product?** It will allow selecting the appropriate energy sources for production, materials, transportation methods and recycling or waste practices.

An LCA assists in making strategic decisions, both in choosing between product alternatives, and in optimizing the environmental performance of business processes. A data-driven approach to identify operational efficiencies through reducing material use, energy use, waste generation and emissions, throughout the entire lifecyle of the product.

Based on the physical flows of materials and energy associated with the product, an LCA evaluates a lot of different effects on the environment. These environmental effects are grouped in various so called impact categories.

The best known and most important impact category is global warming potential or climate change.

Global warming, the changes in surface air temperature, is caused by emission of greenhouse gases (GHG) into the atmosphere. GHG are produced by human activities such as carbon dioxide (CO2), methane (CH4), nitrous oxide (NOx). The different GHG emissions are measured in terms of carbon dioxide equivalents (CO2e).

An LCA is an effective way to
- prioritize and assess opportunities to create added value
- increase brand value (brand positioning)
- improve sustainable design decisions (life cycle impact)
- make better procurement decisions (raw materials as well as suppliers)
- achieve cost savings
- report to stakeholders about sustainability performance

Multiple reliable data sources

Based on years of experience, R<THINK offers an expanded selection of trusted environmental data in addition to Ecoinvent (Zurich, Switzerland).

Expert building blocks ensuring required quality

Ready-made, well-specified, proven descriptions ready for direct use in your reporting.

Data mapping improving efficiency

Unique pairing of client data with R<THINK database data allows for faster processing and helps avoiding mistakes.

A clear report for each stakeholder

R<THINK LCA automatically generates reports in various formats for different stakeholders

Open access, flexible and future proof

The R<THINK LCA environmental software is open ended, the calculation core is verified.

Empower clients to fully control their environmental impact

We believe sharing our LCA knowledge is the only way forward.