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Life Cycle Assessment (LCA)

What Is a Life Cycle Assessment (LCA)?

A life cycle assessment (LCA) is a comprehensive evaluation of the environmental impacts associated with a product, process, or activity throughout its entire life cycle, from raw material extraction to disposal. It considers all stages, including production, transportation, use, and end-of-life management.

An LCA is a decision-making tool that helps companies or organisations make informed decisions about product design, material selection, and process optimization. More than a simple environmental report, LCA serves as the foundation for strategic decision-making that drives profitability and ensures regulatory compliance. For example, Carbon Footprint , Environmental Product Declaration (EPD), or Health Product Declaration (HPD) are based on an LCA approach.

THE Applus+ SOLUTION

The Applus+ Solution for Life Cycle Assessment based on ISO 14040 and ISO 14044

Applus+ provides a structured approach to LCA based on the international standards:

- ISO 14040 Environmental management — Life cycle assessment — Principles and framework, and
- ISO 14044 Environmental management — Life cycle assessment — Requirements and guidelines.

Throughout the entire process, we team up with our clients to ensure a comprehensive understanding of the LCA requirements, to understand their needs, and to reach

consensus on both sides. For this purpose, we can provide tailor-made solutions, ranging from simplified LCA to complex solutions, **using common tools such as SimaPro or One Click LCA, or any other tool of your choice, working with the client's own tool or developing a specific solution.** Applus+ guarantees tool independence, ensuring the technical solution is objective and best suited to your business.

Applus+'s expertise in LCA solutions, together with our knowledge across many end markets and processes, enables us to meet our clients' needs and expectations. Our deep experience in the end market and its processes enables us to provide unique, industry-specific advice tailored to your industry.

As an international company, we can provide this service worldwide, taking into account the specific characteristics of each region.

Target customers

When to implement a Life Cycle Assessment

The service can be implemented whenever there is a need to understand and improve the environmental performance of a product, process or activity.

The service is often implemented during the initial design phase for eco-design and product optimization. Additionally, by identifying areas of inefficiency in resource use, LCAs can help companies optimize their processes, reduce waste, and lower operational costs. This could involve optimizing the selection of raw materials, energy consumption, or waste management practices.

The LCA is also the basis for developing an Environmental Product Declaration (EPD), the use of which is increasingly recommended and requested in sustainable building certifications. Systems such as LEED and BREEAM, which assess the sustainability of buildings, award points for the use of EPD products. An LCA is also the basis on which product environmental footprint, product water footprint, or product carbon footprint are calculated, the development of which is in turn complemented by other specific ISO standards.

Key customer benefits

Key benefits of conducting a Life Cycle Assessment

- An LCA is an opportunity to identify areas for environmental Improvement. It helps **identify hotspots in a product's life cycle where environmental impacts are most significant,** enabling targeted improvements.

- It supports the development of a more sustainable design, as the areas for improvement have been clearly identified. This leads to **long-term profitability** and **reduced operational costs** through process optimization and resource efficiency.
- **An LCA provides valuable information for decision-making regarding materials, production methods, and end-of-life management**, therefore, allowing improvements in process efficiency. An LCA can identify stages with high resource consumption and high environmental outcomes that require management.
- Choosing Applus+ for this process is trusting a reliable partner that will accompany and advise throughout the LCA, during the assessment, publication of results, and /or verification process by a third party. This minimizes greenwashing risk and ensures that your environmental claims are credible and verifiable in the marketplace.

Applus+ Experience in Life Cycle Analysis

Our experience in life cycle analysis (LCA) projects spans a wide range of sectors and assets, following ISO 14040/44 standards and, in some cases, ISO 14067, as well as international guidelines such as the European Environmental Footprint (OEF and PEF) and the ILCD Handbook. The work includes calculating the carbon footprints and environmental impacts of buildings, products, energy supply chains, and entire organizations, covering categories such as climate change, resource consumption, water footprint, air emissions, waste, biodiversity, and noise pollution.

In the energy sector, LCA studies have been conducted for solar photovoltaic, hydroelectric, and liquefied natural gas (LNG) power generation, covering all life-cycle stages from extraction and production to transport, distribution, and consumption. These studies include comparative analyses of national supply systems and assessments of the impacts associated with different energy sources.

In construction, the carbon footprint of office buildings has been quantified to meet life cycle impact reduction criteria for international certifications.

For industrial and food products, carbon footprints have been evaluated for paper materials and specific food products across their entire life cycle.

At the organizational level, global environmental impacts have been assessed for companies with multiple business units, including generation, distribution, mining, port terminals, and offices. In addition, proprietary LCA-based methodologies have been developed to quantify both direct and indirect impacts across all assets.