

Assessing the sustainability of a product over its complete life cycle

This fact sheet is designed to help members of the Cleaning and Hygiene Suppliers Association understand life cycle assessment and establish a way forward.

Definitions

Life cycle assessment (LCA): it assesses the environmental impact of a product over its complete life span, from the extraction of raw materials to the disposal of the product at the end of its lifecycle. It includes all inputs (e.g. water, energy, etc) and outputs (e.g. carbon, waste) and their potential environmental impact. As well as the actual environmental impact (e.g. the use of resources), an LCA includes the potential environmental impact (e.g. consequence of emissions).

Cradle to grave: the full life cycle of the product, from extracting raw materials to disposal at the end of life.

Cradle to gate: partial life cycle of the product, from extracting raw materials to the completion of the manufacturing process, i.e. the factory gate.

Product: any goods or service.

Emissions: substances released into the air, water or soil which negatively impact the environment. These include greenhouse gases (e.g. carbon dioxide) and waste water.

The value of Life Cycle Assessments

A detailed LCA:

- Supports movement towards real environmental sustainability.
- Identifies opportunities for improving the environmental performance of products at various points in their life cycle.
- Supports informed decision making.
- Identifies relevant indicators of environmental performance.
- Provides marketing opportunities by, for example, justifying environmental claims.

Phases of an LCA

Standard practice suggests using a four-phase approach when conducting a LCA as follows.

1. Goal and scope definition: The scope depends on the subject and the intended use of the study. The depth and the breadth differ depending on the goal.
2. Inventory analysis: This phase involves the collection of the data necessary to meet the defined goal(s). This involves compiling and quantifying all the inputs and outputs throughout the product's life cycle.

3. Impact assessment: The purpose of this phase is to understand and evaluate the magnitude and significance of the potential environmental impacts throughout the life cycle of the product.
4. Interpretation: During this phase the results of phases two and three are collated and reviewed in the context of the initial goal(s) and scope and appropriate recommendations made and decisions taken.

Extended guidance on this can be found in the international standard ISO14044:2006 as amended.

Conducting an LCA

There are four main stages in the life cycle of a product or service to consider when conducting an LCA.

1. Extracting and processing raw materials
2. Manufacturing and packaging
3. Use and operation during the lifetime
4. Disposal at the end of the useful life

Each stage involves processes that will consume resources and may release pollutants or harmful substances.

It is advisable to conduct an LCA on your current product(s) and alternative scenarios. This will show the impact of changing different parts of the process, for example in the use of raw materials, energy generation or end-of-life disposal.

Mapping the stages in the life cycle to the phases of an LCA, this chart highlights questions you may wish to consider throughout the process.

Goals and scope definition

What is your sustainability strategy?

What information do you need to deliver your sustainability strategy?

What is the purpose of your LCA?

Inventory analysis and impact assessment

Extracting and processing raw materials

What are the raw materials?

How are the raw materials extracted?

What is the impact of the extraction process on the environment, including the workforce, local population and local wildlife?

What emissions result from the extraction process and what is their impact?

What is the energy usage of the extraction process and how is the energy generated?

What are the waste products of the extraction process and what is their impact?

How far do the raw materials travel?

What are the means of transport and distribution?

Manufacturing and packaging

How much energy is used in the manufacture of the product and packaging and how is the energy generated?

What emissions are generated from the manufacture of the product and its packaging and what is their impact?

What waste is generated during the manufacture of the product and the packaging and how is it disposed of?

What emissions are generated during the manufacturing waste disposal process and what is the impact on the local environment?

What energy is required for the manufacturing waste disposal process and how is it generated?

What are the transport and distribution requirements?

What are the means of transport and distribution?

Use and operation during the lifetime

How is the product used/operated? Is energy required for its use?

What emissions are produced by the use of the product and what is their impact?

What waste is produced by the use of the product and what is its impact?

Does the product require maintenance and repair? If yes, what is the impact of this process?

What is the impact on the local population?

What are the transport and distribution requirements?

What are the means of transport and distribution?

Disposal at the end of the useful life

How might the product be disposed of at the end of its life? There may be multiple disposal routes to consider.

How do these routes depend on the behaviour of others?

What is the impact of the product being disposed of via these routes compared to the impact of its typical means of disposal by the end user?

What emissions are produced during these routes and what is their impact?

What energy is required for these end-of-life disposal processes and how is that energy generated?

If one of the routes for all or an element of the product is recycling, what waste and emissions are produced in the process and what is their impact?

What are the transport and distribution requirements for the different routes?

What are the means of transport and distribution?

Interpretation

How do you intend to report on the findings from the goal and scope definition, the inventory analysis and the impact assessment?

What are the key findings?

In the context of the initial goals, what are the appropriate recommendations based on the findings?

What is the decision making process and what decisions need to be made?