November 2023

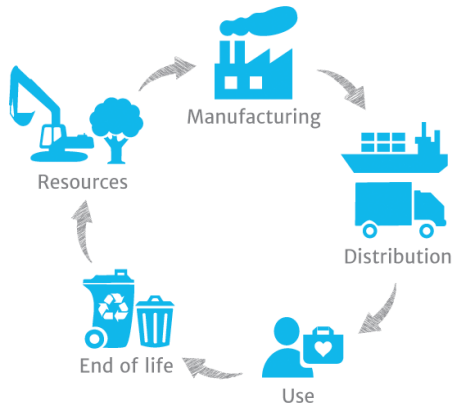
Life Cycle Assessment (LCA) at the CSIR: Our service offering

The CSIR's LCA service offering includes (1) Conducting LCA studies on a wide range of products, materials and services; (2) Review of LCA studies to ensure compliance with ISO standards; and (3) R&D to improve LCA methods, data and indicators, including the development of Guidelines for conducting LCA in South Africa.

What is Life Cycle Assessment?

Life Cycle Assessment (LCA) is a methodology for assessing the environmental impacts of a product or service across its full life cycle – from extraction of raw materials to production, use, and end-of-life.

By quantifying the environmental impacts of a product at each stage of its life cycle, LCA studies can inform decisions by both industry and consumers; to enable eco-efficiency, sustainable consumption and production, and a more circular economy.

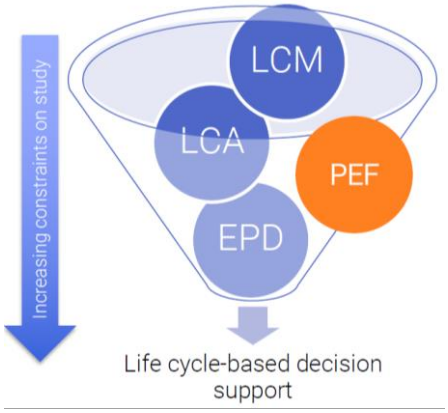


Why undertake an LCA study?

Understanding a product's life cycle can highlight areas for improving product design and environmental performance along the value chain. This can lead to enhanced efficiencies and cost savings, reduced environmental impacts and liabilities, and reduced exposure to resource constraints and risks. LCA studies can also be used to inform environmental claims and marketing campaigns.

Furthermore, under South Africa's **Extended Producer Responsibility (EPR) Regulations** (DFFE, 2021), producers of identified products are required to conduct LCA studies in relation to their products.

Finally, some of SA's key trade partners are requiring that LCA's be undertaken to underpin environmental claims and eco-labelling for products entering their markets; with a requirement for Environmental Product Declarations (EPDs) to be made or for the Product Environmental Footprint (PEF) to be reported.



What do we do?

Our LCA service offering includes:

1. **Conducting LCA studies** on a wide range of products, materials and services
2. **Review of LCA studies** to ensure compliance with the ISO standards
3. **Research and Development** to improve LCA methods, data and indicators; including the development of **Guidelines for conducting LCA in South Africa**.

We also conduct other types of studies, such as Life Cycle Sustainability Assessment (LCSA), Carbon and Water Footprinting, and Material Flow Analysis (MFA).

Our clients include national government, international funders (e.g. Government of Japan and UNIDO), and the private sector (e.g. producers and PROs).

1. Conducting LCA studies

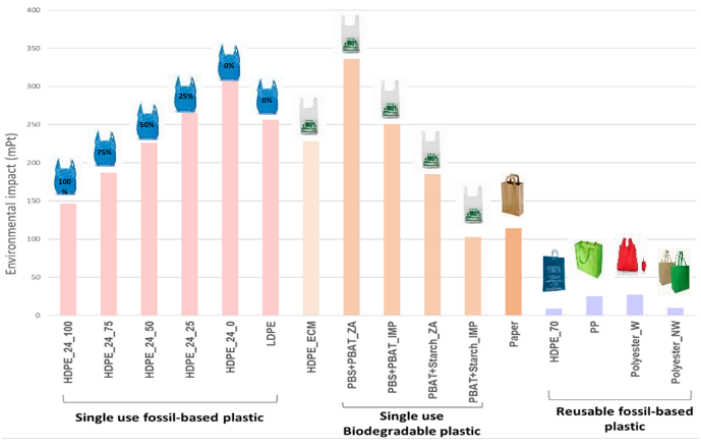
We undertake ISO-compliant LCA studies to **assess the environmental performance of any product, material or service**. These can be conducted in such a way as to:

- Meet the requirements of the EPR Regulations
- Fulfil export market requirements (e.g. PEF requirements for the EU market, or EPDs)
- Identify “hot-spots”; to inform eco-efficiency, value chain optimisation, improved production processes and improved product design
- Verify environmental claims
- Inform eco-labelling and marketing.

In addition, we can undertake **comparative studies** and **scenario analysis** aimed at comparing the environmental performance of alternative products, materials, technologies, processes or designs. This can help inform government, producers and consumers regarding the most sustainable alternatives from a life-cycle perspective.

Examples of recent LCA studies undertaken by the team include:

- Comparison of grocery carrier bag options to inform the most sustainable type of carrier bag
- Comparison of polystyrene take-out containers and material alternatives
- Life cycle assessment of Green ammonia produced at a coastal facility in South Africa.



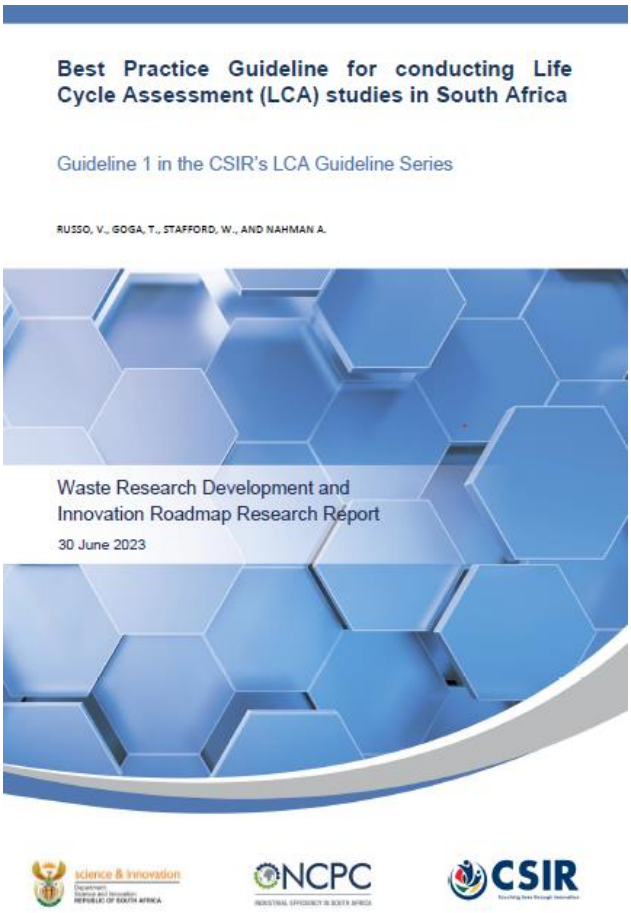
2. Review of LCA studies

We are able to undertake critical peer reviews of LCA studies, in accordance with ISO standards 14040 and 14044, to ensure that such studies are ISO compliant.

Recent clients include Safripol (Pty) Ltd, University of the Western Cape, Avery Dennison South Africa, and Southern Wind Shipyards (Pty) Ltd.

3. Research and Development

We undertake R&D to improve LCA and LCSA methods, models and indicators and their applicability to the South African context.



For example, with funding from the Department of Science and Innovation and the Department of Trade, Industry and Competition, we are developing guidelines for conducting LCA studies in SA. The guidelines are aimed at supporting government and industry by:

- Enabling LCA studies to be conducted in accordance with the ISO Standards, EPR Regulations and export market requirements
- Harmonising the different standards and requirements
- Making recommendations on methodological choices
- Standardising the application of LCA in South Africa, in line with best practice.

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