

# Life cycle assessments to guide sustainable packaging design



Tetra Pak Oceania's LCA comparative study found the carton has the lowest carbon footprint of all food and beverage systems in Australia.



**To optimise circular and sustainable design packaging technologists need to look at the potential environmental impacts of the product across its lifetime, writes Nerida Kelton.**

**E**NVIRONMENTAL impact categories can include greenhouse gas emissions, water depletion, mineral consumption, land transformation, eutrophication, toxicity, and many more factors can be brought to light through a life cycle assessment (LCA).

This type of assessment can look holistically at environmental impacts of products and associated packaging – from raw materials, to production, through to household, and then at end-of-life.

Now more than ever gathering science-driven information – that is, derived from LCAs – is an important step in ensuring that your product and packaging have the lowest environmental impact wherever possible across the entire value chain.

When used in the packaging industry, an LCA can provide accurate data that can guide a business in the choice of materials,

pack shapes and sizes, but also when looking to move to a more sustainable material or pack. The recyclability of the packaging, the ability to re-use and refill the packaging and meeting the 2025 National Packaging Targets must also be considered and can be checked as a design choice with LCAs.

Using LCAs within this decision-making process ensures that the business has all available datasets in front of them to make informed choices. An LCA can eliminate second-guessing and assumptions about sustainable packaging choices and can provide concrete information that crosses all areas of the supply chain.

## START WITH A LIFE CYCLE MAP

Before you undertake an LCA, establish a cross-departmental and cross-supply chain team to create a life cycle map of your product and packaging.

The life cycle map needs to provide a clear and concise representation of the steps required to source and produce the product-packaging system, the distribution system, as well as its use, disposal and recovery.

Determining inputs and outputs to life cycle stages on the map, such as energy, materials, and emissions should then start to reveal blind spots and impact categories or priority areas to focus on. The map will also help to identify areas of improvement, challenges and unexpected consequences of possible product or packaging choices.

## STREAMLINED LCA OR FULL LCA

Once you have established your life cycle map, the next step is to decide whether you would like to undertake a streamlined LCA or a full LCA on the product. To do this, you need to define the goal and scope of the LCA.

You need to determine the purpose of the study: internal improvement or public claims, the system boundaries to be set, the inventory to be collected, the impact assessment to be applied, and the interpretation method that will enable the business to arrive at conclusions and recommendations.

A streamlined LCA is ideally suited when a business is looking to better understand the blind spots and any major areas of focus within the life cycle of a product or to make internal decisions about

something to change in the life cycle. Streamlined LCAs can produce results quickly, are ideal for SMEs and can assist in meeting the 2025 National Packaging Targets. They are also a great way to determine if a full LCA is required.

Full LCAs are comprehensive reports that meet international ISO 14040/14044 standards for LCAs. The data is permitted to be used for internal assessment purposes and within the public domain when undertaking either a standalone assessment or when comparing more than one product or packaging system. If publicly

disseminating a study, the ISO standards suggest peer review, which is often conducted for companies going down this road by an external panel or party. An example of a full LCA is a comparative study called Beverage and Food Packaging in Australia and New Zealand that was recently commissioned by Tetra Pak Oceania.

## BENEFITS OF LCAS

There are so many benefits of embedding LCA into all areas of the business including lowering environmental impacts, optimising packaging material choices, improving

## LCA EDUCATION

The Australian Institute of Packaging (AIP) runs a training course, in conjunction with RMIT, on life cycle assessment tools for sustainable packaging design and has a resource library that includes the *Packaging for Sustainability* textbook.

the sustainability of a product and its whole-of-life and improving your triple bottom line. LCAs can also contribute to making more informed decisions when it comes to sustainability and carbon foot printing. These decisions are made easier when a packaging technologist embeds an LCA into packaging design.

When embarking on the use of an LCA, it is important to note that the process is not a silver bullet. LCAs should be seen as an investigative and comparative process that can identify areas of improvement within the whole-of-life of your product and packaging.

As Dr Karli Verghese (FAIP) said in her book *Packaging for Sustainability*, "Life Cycle Assessment can produce convincing evidence that intuition is no longer enough".

An LCA is quite simply an additional tool in the tool belt to ensure that decisions are well informed and science driven. ■

*Nerida Kelton is the executive director of the Australian Institute of Packaging (AIP) and the vice-president (Sustainability and Save Food) of the World Packaging Organisation (WPO).*

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