

LCA of Tetra Pak: In a nutshell

March 2026

How do Tetra Pak cartons stack up against other types of beverage packaging in Australia and New Zealand?

To find out, Tetra Pak asked sustainability firm thinkstep-anz to undertake a Life Cycle Assessment (LCA) that compared the carbon footprint of its cartons to commonly used packaging alternatives.

This is a summary of a wider LCA study. You can find the full report here:

<https://tinyurl.com/Tetra-Pak-LCA>

Our study follows best practice based on ISO 14044 for Life Cycle Assessment and ISO 14067 for product carbon footprinting. As a comparative study, it has undergone a critical review by a panel of three independent experts.

What we found



Cartons

Cartons have the **lowest carbon footprint** of all beverage packaging options in Australia.

In New Zealand, cartons have one of the lowest carbon footprint of all packaging options.



Glass

Highest carbon footprint, even with 70% recycled content.



Aluminium

Much higher footprint than cartons, even with high recycled content.



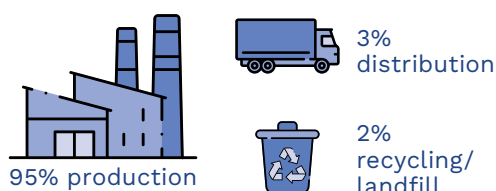
Plastic

(PET, rPET and HDPE)

Lower than glass or aluminium, but still higher than cartons in most cases, especially for smaller packs and long-life products.

On average, 98%* of carbon footprint occurs before packaging hits the shelf.

Contribution from packaging:



*Based on GWP-fossil results



Product innovation makes a difference:

Advanced formats like Tetra Brik® Aseptic 1L Edge, Tetra Top® 1L and Tetra Stelo® Aseptic rank among the best performers in their categories, offering some of the lowest carbon footprints.

The study



We calculated the carbon footprint of 26 different Tetra Pak carton packages.



We calculated the carbon footprint of 78 different packages we bought in 2024 in Australia.



We compared the results to understand how the carbon footprint of Tetra Pak cartons stacks up against other packaging options.



What is a carbon footprint?

LCA measures different types of environmental impacts, like carbon emissions, water use and resource use.

In this summary report, we focus on carbon emissions (measured in kg CO₂e). A carbon footprint adds up all the greenhouse gases released over a product's life.

What we compared

We measured the impact of one unit of consumer packaging. This is the packaging a consumer buys with a beverage at the supermarket (like a bottle, carton or pouch). The study looked only at the packaging itself, not the beverage inside.

To make fair comparisons, different types of packaging were grouped by how they're used and by size.

The beverage packaging choices we investigated:

- **packaging sizes** (from 250mL to 2L)
- **products** (white milk, juice and ready-to-drink coffee and protein drinks)
- **ways these products are filled** (including fresh products that need refrigeration, shelf-stable aseptic packaging, and chilled aseptic packaging)
- **primary packaging materials** (cartons, PET bottles, recycled PET (rPET) bottles, HDPE bottles, pouches, aluminium cans, and glass bottles).

The seven packaging materials:



Cartons
(Tetra Pak)



PET
bottles



Recycled PET
bottles (rPET)



HDPE
bottles



Pouches



Aluminium
cans



Glass
bottles

The study included the entire packaging life cycle

We investigated the entire life cycle of each packaging option, as well as the packaging used for the products to reach consumers.

This included:

- consumer pack
- a one-way shipper carton or reusable crate
- a pallet.

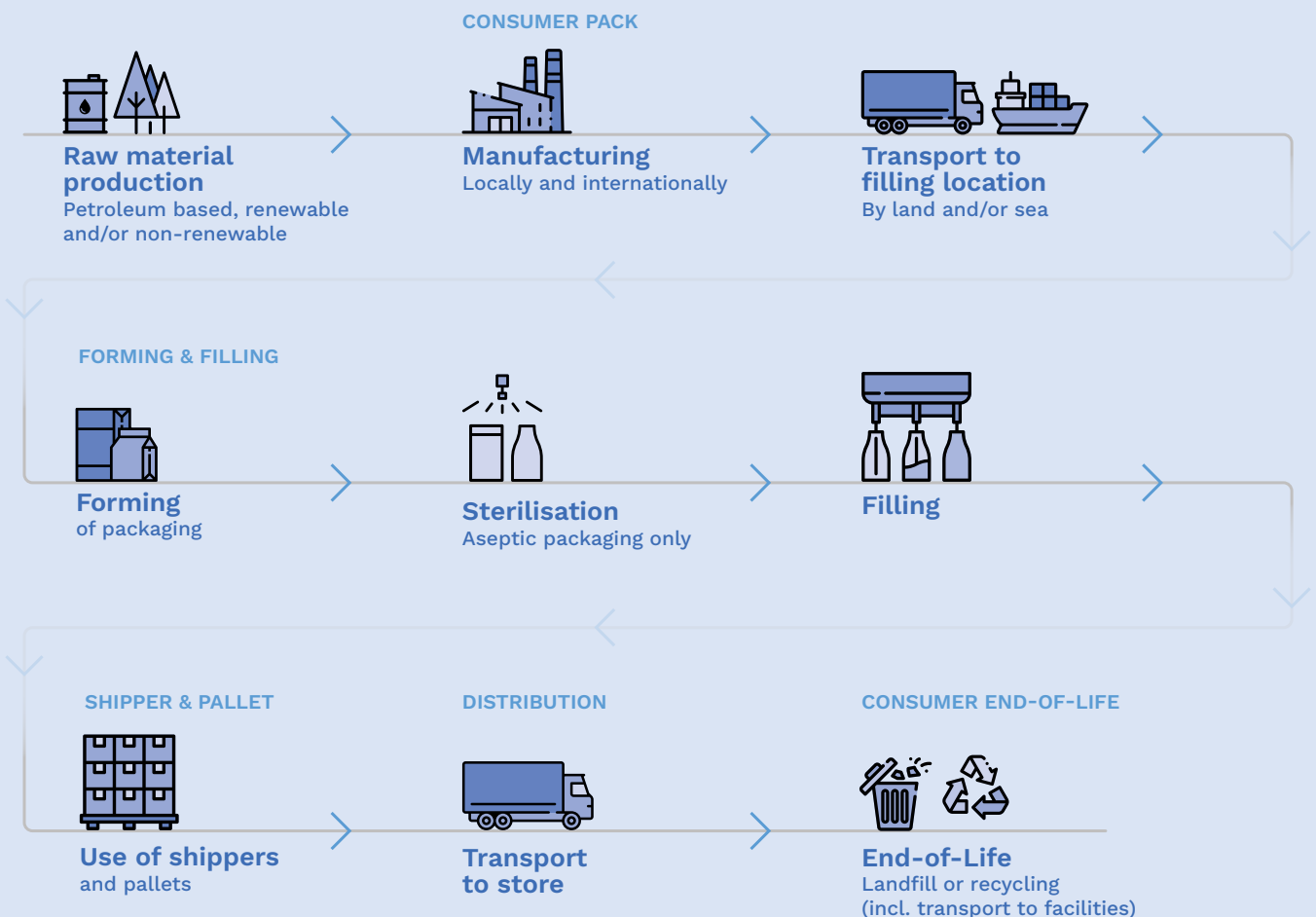
What LCA tells us

LCA is a tool that calculates a snapshot of a product's environmental footprint over its life cycle.

This includes what goes into the product to make it, like energy and raw materials. It also includes what comes out during manufacturing, transport and when it is disposed – the energy and waste.

LCA provides science-based data that helps us understand, manage and talk about our cartons' environmental impact.

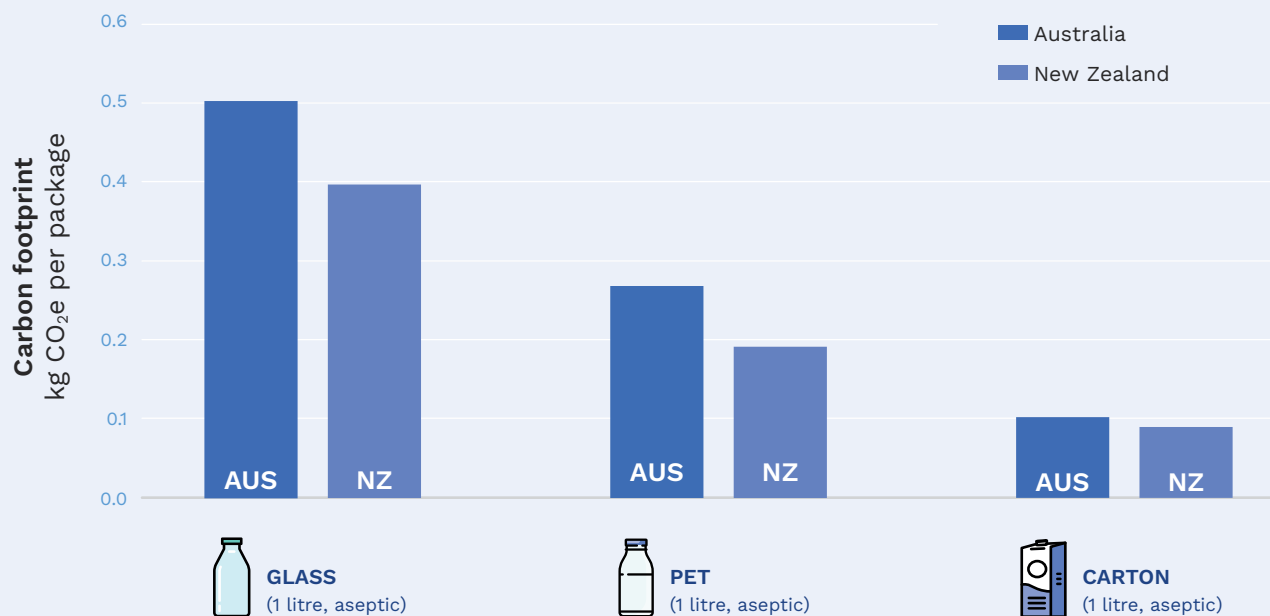
Packaging life cycle



Where the footprint comes from

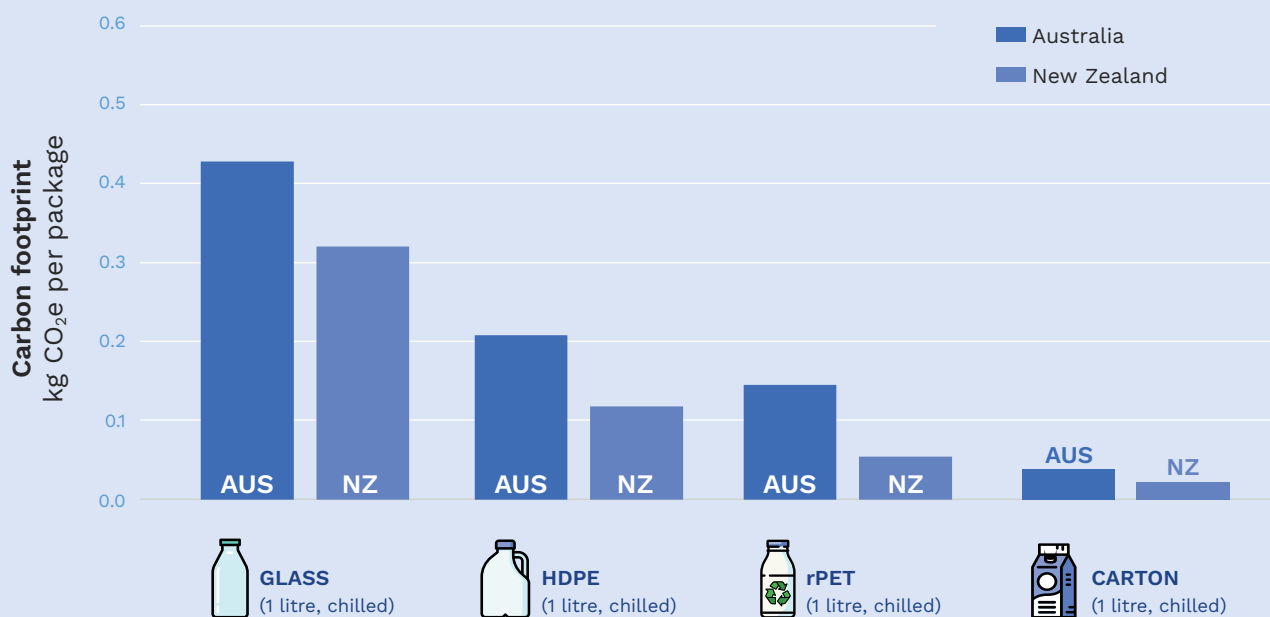
Aseptic (long-life) beverages

Comparison of carbon footprints for 1 L aseptic juice packs in Australia and New Zealand, benchmarked against the Tetra Brik® Aseptic 1 L Edge LightCap 30 carton.

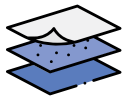


Chilled beverages

Comparison of carbon footprints for 1 L chilled milk packs in Australia and New Zealand, benchmarked against the Tetra Rex® 1 L OSO34 carton plant-based.



What we found



Materials drive emissions

On average, more than 95 percent of emissions come from producing consumer packaging. Glass, aluminium and most plastics require more energy to make. Cartons perform better because they use fewer resource-intensive materials and have a high share of renewable paperboard.

1 L glass bottle

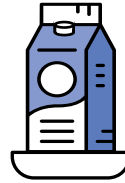
510 grams

17x heavier



1 L carton

30 grams*



Lower weight means lower impact

Filling and transport add little to total impact. However, a 1 litre carton (30 grams) is up to 17 times lighter than a glass bottle, which reduces fuel use and associated transport emissions. Lower-weight packaging also uses fewer resources across the supply chain, supporting a lower overall carbon footprint.

*Tetra Brik® Aseptic 1 L Edge carton



End of life has only a small impact

The end-of-life stage contributes only about 2 percent to a package's total carbon footprint. Carbon emissions from landfill and recycling are low for most material types. While there are carbon emissions from cartons in landfill, these emissions are balanced out by carbon stored by trees in the plant fibres used to make our paperboard.



Why Australia and New Zealand results differ

Australia's electricity has a higher carbon intensity than New Zealand's largely renewable grid. As a result, packaging made or filled in Australia has higher carbon emissions than the same packaging produced in New Zealand.

How we tested our assumptions

To make sure the results were reliable, we tested how they would change under different real-world conditions. This included looking at what happens to cartons at the end of their life, how much recycled material is used in glass and aluminium packaging, how recycling affects their carbon footprints, how biogenic carbon is treated when cartons are recycled, and how transport distances influence results.

Across all these tests, cartons consistently had the lowest or equal-lowest carbon footprint. This shows the results are robust and not sensitive to one data set or assumption.



What has changed since 2021

This LCA builds on our 2021 study and reflects how beverage packaging in Australia and New Zealand has evolved: designs are lighter, recycling systems have expanded, and more materials now include recycled or renewable content.

The new report helps Tetra Pak and its customers make transparent, data-based decisions to reduce carbon emissions and drive innovation in packaging.

The 2025 LCA:

Broader scope

Investigated 100+ packages from Australia and New Zealand.

Updated data

Uses updated manufacturing and energy data from databases.

Refreshed modelling

Adds detailed landfill, recycling and biogenic-carbon accounting for more conservative, science-based results.

Despite other packages improving, cartons still show the lowest or equal-lowest carbon footprint across most beverage types and sizes in both countries.

How Tetra Pak can use the data

Guide packaging choice

Help brands choose the lowest-impact option for their product category and quantify potential carbon savings when switching to cartons.

Drive improvement and innovation

Use the study's recommendations to focus R&D and supplier collaboration on low-carbon materials and better data quality for plastics and biodegradability.

About Tetra Pak

Tetra Pak is a world leading food processing and packaging solutions company. Working with our customers and suppliers, we provide access to safe, nutritious food for hundreds of millions of people in more than 160 countries every day.

With over 24,000 employees worldwide, including local presence in Australia and New Zealand, we commit to making food safe and available, everywhere, and we promise to protect what's good: food, people and the planet.

Tetra Pak

www.tetrapak.com/en-anz
oceania.enquiries@tetrapak.com

This study was conducted on behalf of Tetra Pak Oceania.

This study is specific to the packaging options and technology available in Australia and New Zealand in 2024-2025 and is not necessarily transferable to other markets.

About thinkstep-anz

thinkstep-anz is an independent sustainability firm with offices in Australia and New Zealand and a global reach. We help organisations put sustainability at the heart of their business to drive success and inspire progress.

Using data and insight, we help clients understand their impact and take practical steps forward. Since 2006, we've combined technical expertise and business know-how to create value and help organisations tell their sustainability story.

thinkstep-anz

www.thinkstep-anz.com
engage@thinkstep-anz.com



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