



LCA of Beverage Cans in South Africa

Summary report

A summary of the Life Cycle Assessment commissioned by MetPac-SA

September 2026



WHY WE DID THIS STUDY



South Africa's **Extended Producer Responsibility** (EPR) regulations require that an LCA be conducted on identified packaging products within 5 years of scheme implementation

MetPac-SA commissioned this study to meet that requirement, and to give the metal packaging sector real, usable insights into how to improve.

The regulations point to three focus areas, which guided this study:



Minimise the aluminium (and other materials) used in beverage cans



Design cans to be recycled or recovered easily, without losing material value



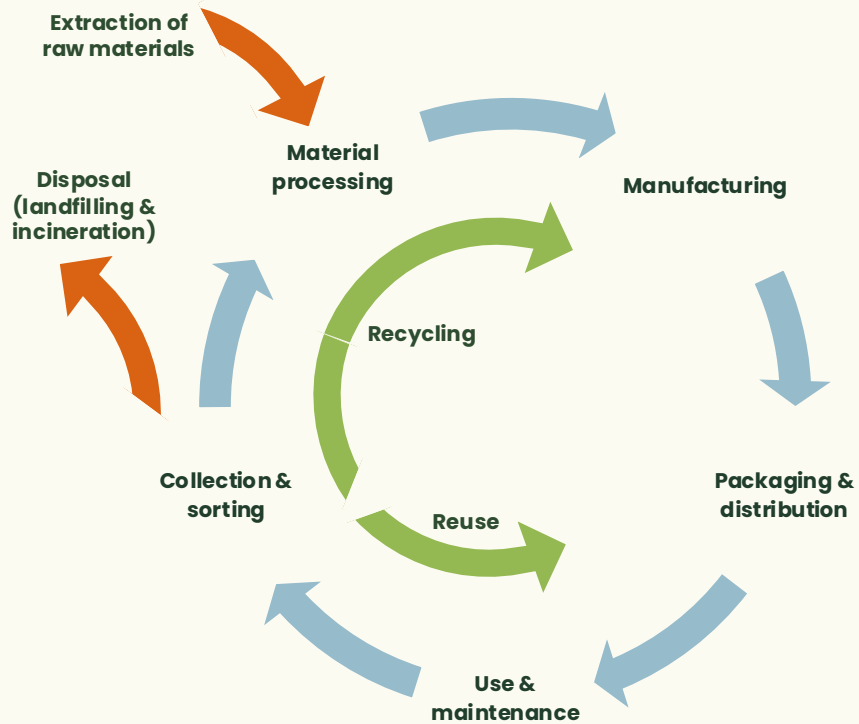
Reduce environmental toxicity of the waste stream

THE QUESTION WE SET OUT TO ANSWER

What's the most sustainable way to make and manage an aluminium beverage can in South Africa — from raw materials to end-of-life?

To answer that, we needed to know:

- Where do impacts come from in producing a can?
- What happens to a can after use, and which end-of-life option is lowest impact?
- Does recycling really pay off, and by how much?
- What are the circularity and social (income) benefits?



LCA is a structured way of measuring everything that goes into making a product – and everything that comes out.

That means raw materials and energy going in, and emissions, waste and by-products coming out, at every stage from extraction to disposal.

It lets us compare options fairly, spot where the biggest impacts sit, and understand the trade-offs between them.

WHAT WE STUDIED



Focus product: 330 ml can

*Historically ~70% of the South African market
Other can sizes are compared in a sensitivity analysis*

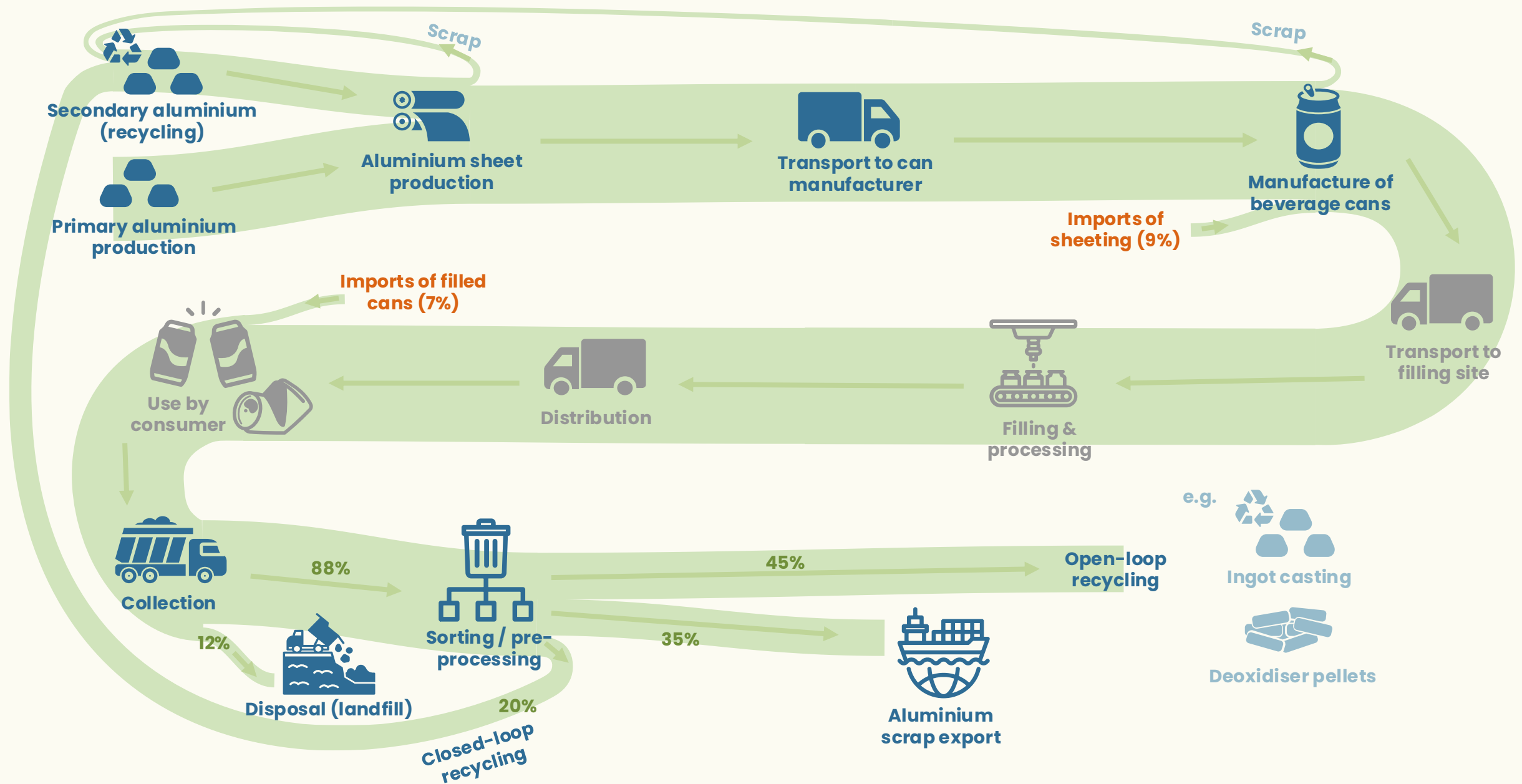
In scope:

- Raw material production (bauxite, virgin and recycled aluminium)
- Can body & end sheet manufacturing
- Can forming and coating
- Collection and end-of-life processing of used cans
- Transport between all these stages

Out of scope:

- Filling
- Distribution
- Retail
- Consumer use

These contribute very little to a can's footprint and aren't central to the questions we're answering



WHAT WE FOUND



Every recycling route reduces impacts, even after accounting for the energy needed to collect and reprocess the aluminium



Closed-loop, can-to-can recycling delivers the biggest benefit of any end-of-life option

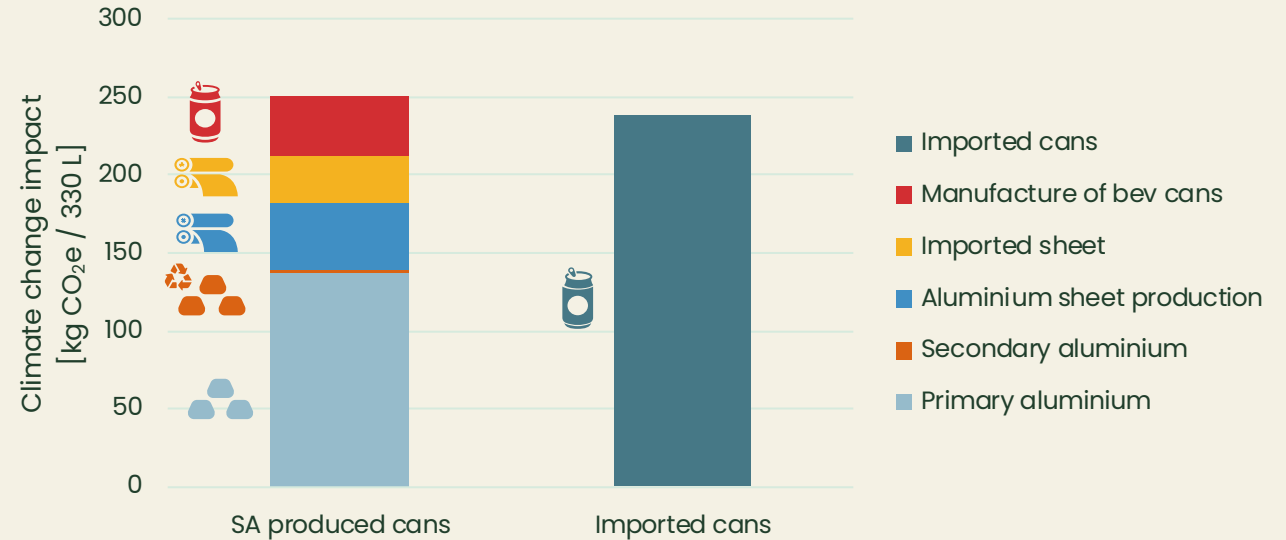


Recycled aluminium has substantially lower impacts than virgin aluminium, across every environmental measure we looked at



Recycling is the single biggest lever this industry has for reducing its footprint

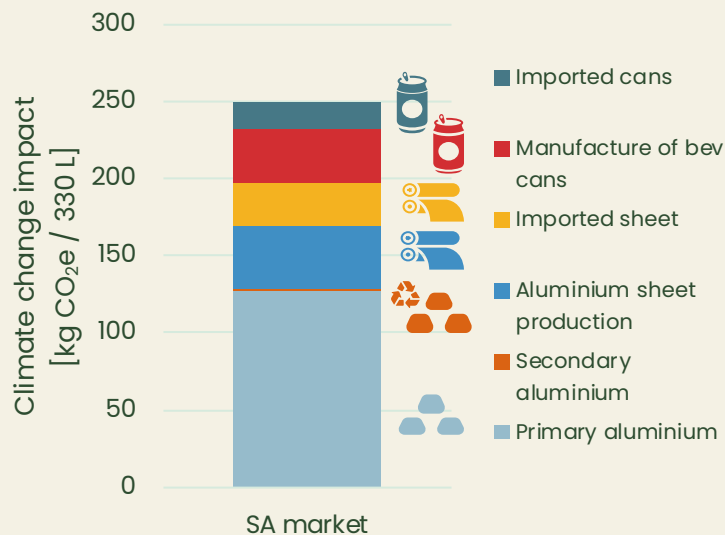
CAN PRODUCTION BREAKDOWN



- **Virgin aluminium is the single biggest source of environmental impacts** — about two-thirds* of an SA-produced can's total climate change footprint, mostly from the electricity used to smelt bauxite into primary aluminium.
- **Energy used for sheet rolling and can forming in South Africa is the next largest contributor.** This reflects the carbon intensity of South Africa's coal-based electricity grid.
- **Recycled aluminium feedstock barely registers by comparison.** Its impact is a fraction of virgin metal's, because it skips the energy-intensive smelting step entirely.
- Cans produced in South Africa have a marginally higher climate change impact than **imported cans**.
- While the results shown are only for climate change impact (carbon footprint), the same trends emerged **across all impact indicators** calculated, including human health and ecosystem quality and non-renewable resource depletion.

**this includes primary aluminium production and a portion of the imported sheet that is made from primary aluminium*

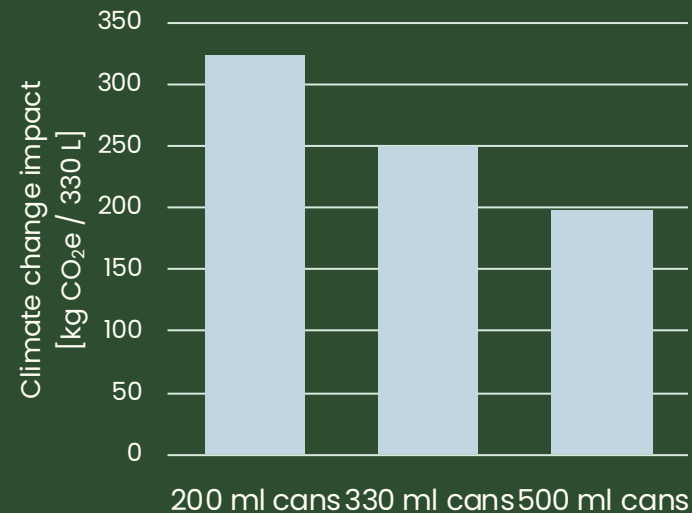
MARKET FOR SA CANS



Imported cans make up 7% of the market in South Africa

Accounting for this, the **cradle-to-gate carbon footprint** of a can on the SA market is **249 kg CO₂e / 330 L**

DOES CAN SIZE MATTER?



Yes, bigger cans are more efficient.

Larger formats use less material per litre of beverage packaged, and so carry a lower footprint per litre.

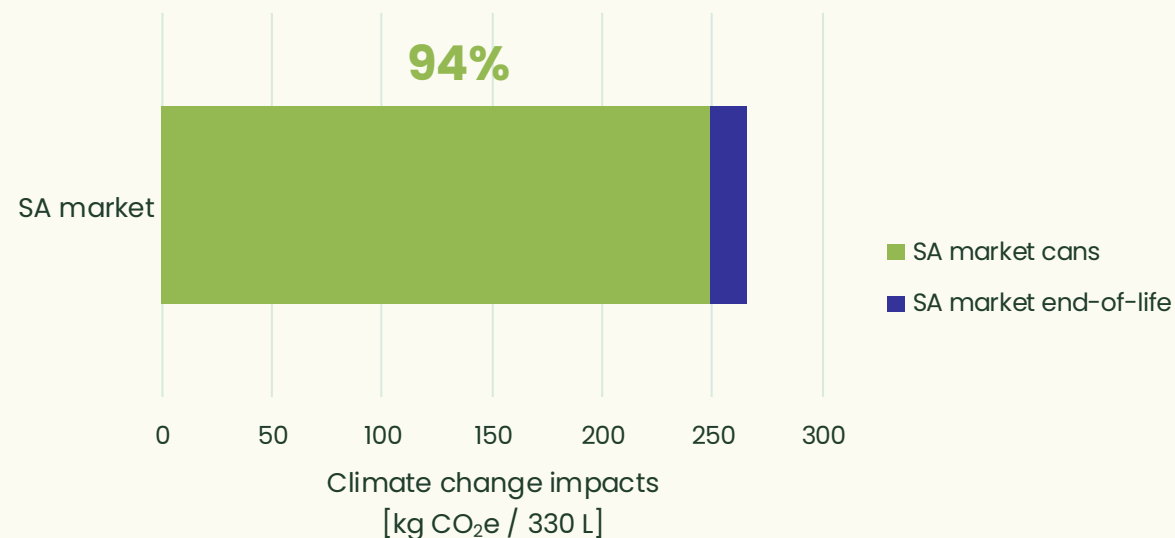
THE FULL LIFE CYCLE

Combining the **cradle-to-gate impact of cans on the SA market** with the **end-of-life treatment of beverage cans in SA** yields the graph on the right. The cradle-to-gate phase (can production/import) dominates the life cycle impacts, accounting for **94% of climate change impact**.

While this graph shows the climate change impact, the **same trend emerges across all impact indicators** evaluated, including those contributing to human health damage and damage to ecosystem quality.

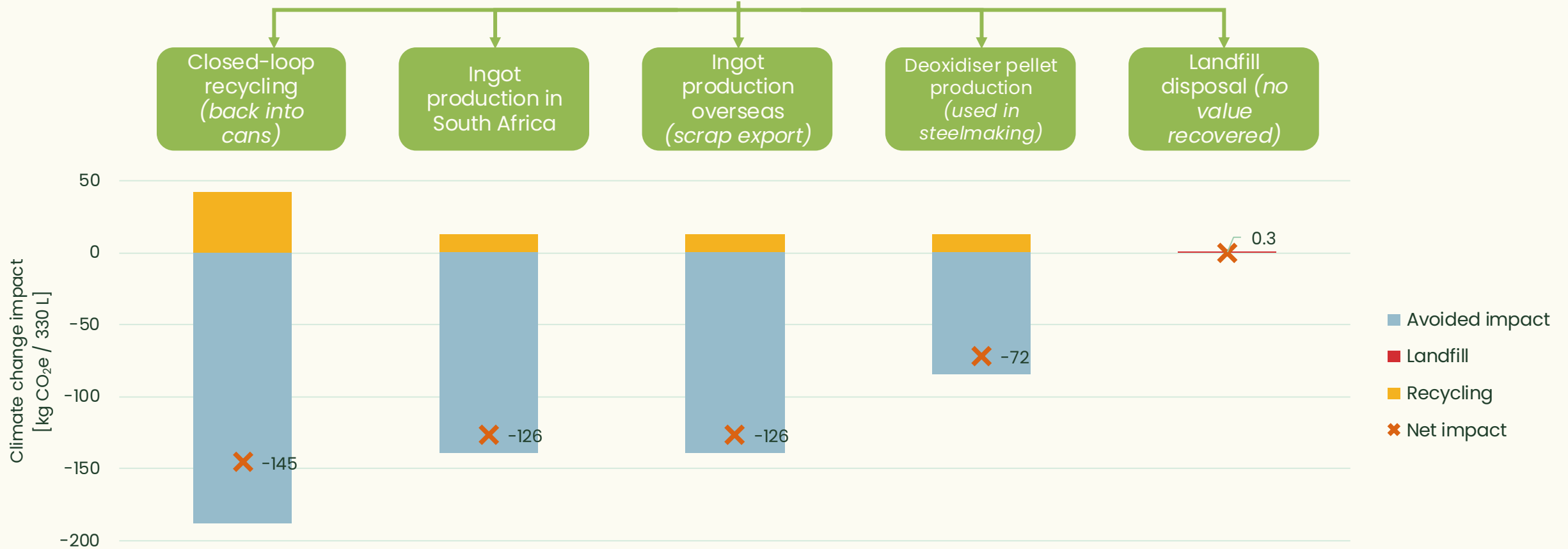
The **end-of-life impact*** shown in the graph is a market mix of treatment scenarios occurring in South Africa, with 88% of cans collected for recycling.

**this figure does not include primary materials avoided by producing secondary aluminium*



AFTER USE: Which end-of-life route is best*?

We compared *five possible destinations* for a used can, once collected

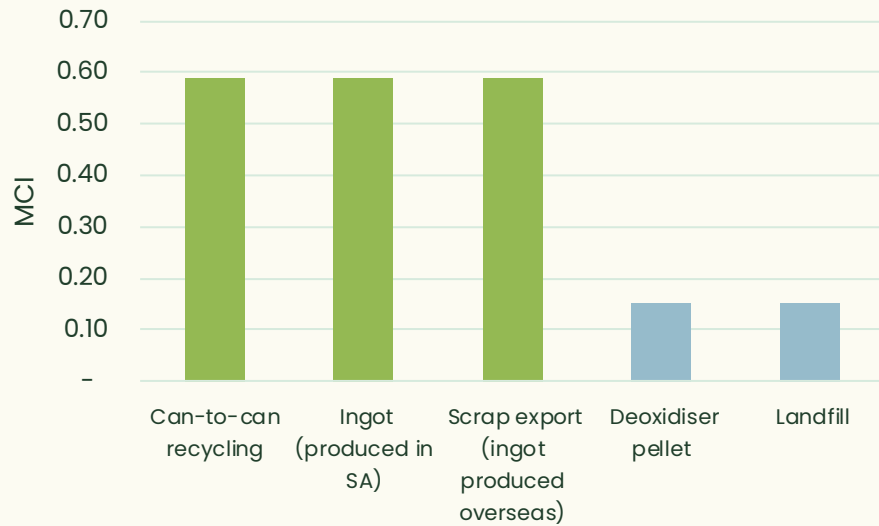


- **All four recycling routes reduce net emissions below zero**, meaning the benefit of avoiding new virgin material production outweighs the impact of recycling itself
- **Closed-loop recycling wins because it displaces the most carbon-intensive material: virgin South32 aluminium.** Recycling UBCs into ingots comes a close second. Recycling into pellets still reduces climate change impact, but delivers roughly half the benefit, because the aluminium is consumed rather than kept in circulation.

**for this analysis we applied system expansion as it best reflects the benefits of recycling, that is, it credits the beverage can system for the avoided production of primary aluminium.*

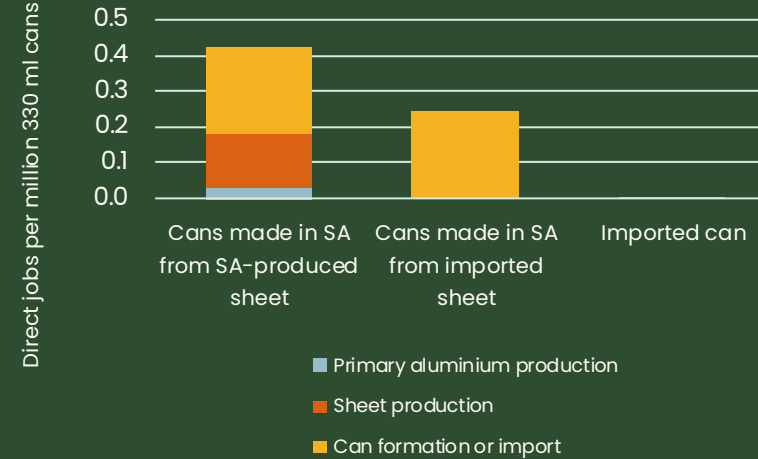
IT'S NOT JUST ABOUT CARBON

The **material circularity indicator (MCI)** provides a quantitative assessment of the circularity of a system, varying from 0 for a linear system (i.e. virgin input, use and disposal) to 1 for a fully circular system (i.e. 100% recycled input, use and 100% recycling, with no material lost during recycling)



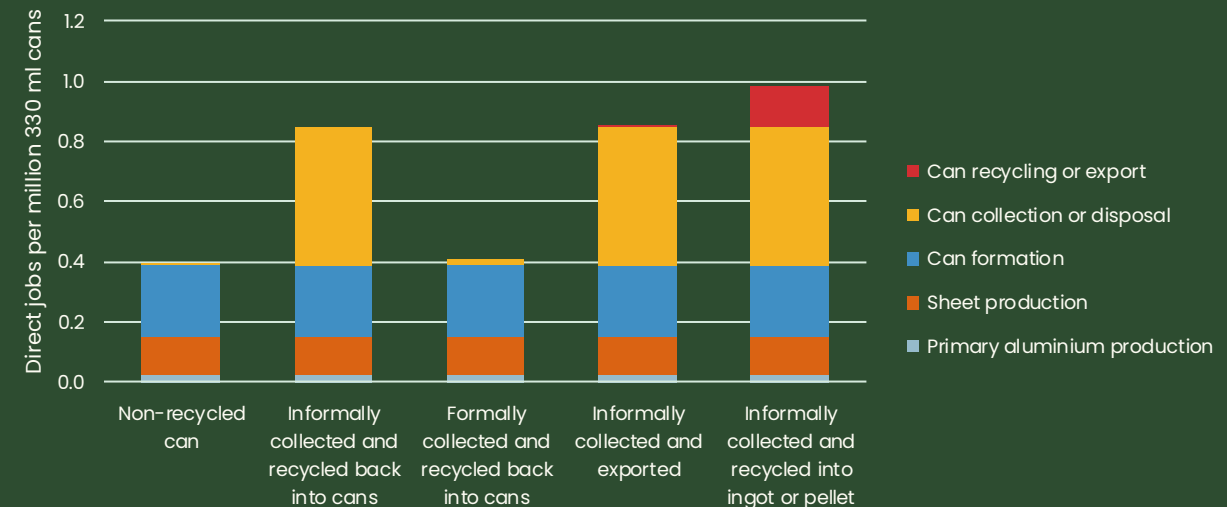
Recycling routes that **keep aluminium in circulation** — closed-loop (recycling back into beverage cans) and production of ingots (recycled back into other aluminium products) — score around 0.6 on the MCI.

Deoxidiser pellet production and **landfill** both score around 0.15, because the aluminium's **value is lost rather than kept moving through the economy**.



Producing cans locally (especially from locally-produced sheet) supports far **more direct employment** than importing finished cans

Collecting and recycling cans in South Africa adds **further income opportunities** on top of direct jobs. **Informal collection of UBCs** supports a **very large number of livelihoods**, although this number is hard to pin down precisely.



WHAT THIS MEANS IN PRACTICE

Circling back to the three EPR focus areas



Minimise materials

Increase recycled content in aluminium sheet; recycled aluminium's impact is a fraction of virgin metal's



Design for recyclability

Closed-loop, can-to-can recycling delivers the greatest benefit of any end-of-life route. Every can kept in that loop multiplies its value.



Reduce environmental toxicity

Keeping cans out of landfill and in circulation reduces both environmental impact and material lost from the economy



The single biggest opportunity: shifting collected scrap away from export and deoxidiser production, and back into closed-loop, can-to-can recycling in South Africa.



CONTACT



Kishan Singh
Kishan@metpacsa.org.za
+27 82 776 2201



Pippa Notten
pippa@tgh.co.za
+27 21 671 2161

ABOUT THIS STUDY

This study was conducted by **The Green House** on behalf of MetPac-SA, following ISO 14044:2006 Life Cycle Assessment standard.

Results are **specific to the South African** aluminium beverage can market and the data available at the time of the study (2026). They are not necessarily transferable to other markets or time periods.

To **access the full report**, please contact MetPac-SA directly.