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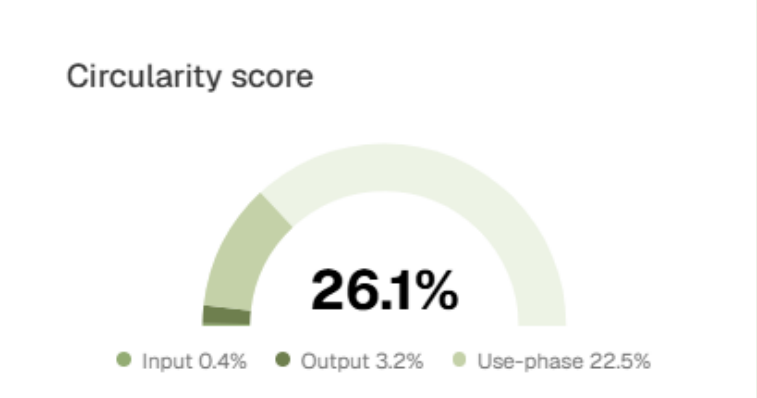
Circularity Score in Målbar LCA

What it measures, how it is calculated, and how to use it

What the Circularity Score is for

The Circularity Score is a question about the future



When a product is designed, most of its climate impact is already determined and documented.

But what happens to the materials afterwards is not. Will they find their way back into the economy, or end up in landfill? Will the design choices made today make recovery easier or harder?

The Circularity Score is an attempt to answer that question. Not with certainty, but with the best available evidence about how circular a product's material flows are, and how much potential they carry.

How the score works

The Circularity Score is a score from 0% to 100%.

Score of 0: fully linear

No recycled or reused material in the product.

Nothing recovered or recycled at end of life.

No documented lifetime extension.

Represents a traditional linear economy.

Score of 100: fully circular

No virgin material input whatsoever.

All material flows back into the economy.

Complete closed loop, no material waste.

Theoretical ideal; not fully achievable today.

A score of 100% cannot be achieved under current conditions. The infrastructure to document and verify all required conditions like complete take-back schemes, full material recovery, and zero quality loss does not yet exist. Most products will likely score low today, particularly those built from conventional materials without a strong recycled content or recovery infrastructure behind them. This is expected. The score will rise over time as both product design and real-world recovery infrastructure improve.

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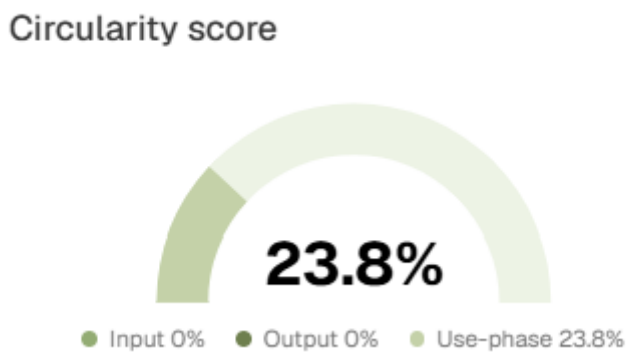
Methodology

The score is based on the Material Circularity Indicator (MCI), originally developed by the Ellen MacArthur Foundation.
Målbar has enriched the base methodology with the allocation logic from the EU Product Environmental Footprint (PEF) framework; specifically, the Circular Footprint Formula (CFF) and its A-factor.

Unlike climate calculation, the Circularity Score is not an impact figure. It does not measure emissions or environmental damage. It is a purely proportional measure of how circular the material flows in and around the product are.

The A-factor is set by the PEF framework, not by Målbar. It reflects a policy judgement about what matters more for a given material category: using it recycled (input) or making sure it can be recycled again (output).

THE THREE COMPONENTS
Input, Output and Use-phase



Input and output are calculated directly from the data you enter. Together they make up approximately 75% of the score. The Use-phase then acts as a multiplier on that result. It can boost or reduce it depending on the product's documented lifetime and services.

Input (approximately 35%)

Input measures how much of the product comes from recycled, reused, or remanufactured material rather than virgin raw material. The higher the recycled content across your components and materials, the higher your input score.

In Målbar LCA, this is driven directly by the recycled content percentage you enter for each material. A material with 0% recycled content contributes 0% to the input score; 100% recycled content can contribute up to 100% of its share of the 35%. The A-factor and the quality ratio (defined by PEF) moderate this: materials that lose quality when recycled receive less credit, even with high recycled content.

Output (approximately 40%)

Output measures how much of the product's material is actually recovered at end of life accounting for recycling, landfilling, and incineration. The key factor is not whether a material can theoretically be recycled, but the collection rate: the real-world share that is actually collected and processed.

Aluminium illustrates this clearly. It is technically close to 100% recyclable, but if the collection rate for the relevant product category is 30%, then only 30% of the aluminium contributes to the output score regardless of design intent.

What is collection rate?

Collection rates are based on EU-level statistics and vary by material category and product type. A chair, a lamp, and a table made from identical materials can therefore have different output scores, because the infrastructure and collection behaviour may differ across those product categories.

To activate the output calculation, at least some components in Målbar LCA must be marked as Design for Disassembly. Without this, the recycling benefit is very limited regardless of material choice.

Use-phase (approximately 25%)

The use-phase component does not add a fixed percentage on top of Input and Output. It is a relative multiplier applied to the combined input/output result. Crucially, it works in both directions: a product with a long-documented lifetime and active services (repair, take-back) will receive a boost; a product with a short lifetime and no services will receive a penalty.

At present, the use-phase is fixed to the product category. For furniture, the default lifetime is 15 years. This means all products in the same category start with the same contribution. The ability to enter verified lifetime data, repair rates, or take-back documentation is planned as a future feature but requires a standardised methodology for converting commercial service data into a calculable circularity input.

What you can and cannot change

Within your control

- Increase the recycled content percentage for each material in your screening.
- Apply Design for Disassembly to components where it is genuinely the case.
- Choose materials with higher real-world recycling rates where structurally and aesthetically viable.

Fixed by methodology or data (not adjustable)

- Collection rates: set by EU-level data per material and product category, not by individual design.
- The A-factor: set by the PEF framework.
- Use phase contribution: currently fixed to product category (e.g., 15 years for furniture).

Using the score in product development

The Circularity Score is most valuable before a product is finalised. At the point where material choices, component structures, and end-of-life scenarios are still open questions, the score gives product developers and designers a concrete, comparable figure to work with.

Swapping a material, adding Design for Disassembly to a component, or increasing recycled content will move the score. Running those comparisons during development costs nothing and changes everything about the quality of the decision being made.