The environmental impact of reusing doors: how much of a benefit is there really?

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The reuse of building elements or components is often automatically regarded as sustainable. The more you reuse, the better or so it seems. But is that really true?

In this article, we will focus on environmental impact and how organisations influence it; in a second article, we will examine the business case in relation to the organisation of reuse.

Curious how this environmental gain translates into a viable business approach? Discover it in the second article on the business case for door reuse.

Just how significant is the environmental impact of reusing doors, and does it therefore make ecological sense?

That question was central to the **Digital Door Twin project**, a collaboration between **Sirris**, **Buildwise** and **Kulapro**. As part of this project, the environmental impact of reusing wooden doors was analysed using a simplified life-cycle assessment and project data.

Why objective evidence of environmental impact is needed

Circularity is often associated with intuitive benefits: less waste, fewer new materials, lower CO? emissions. However, in practice, it is not always easy to demonstrate those benefits. Without figures and a clear context, reuse is still a good idea, but there is no clear picture of the preconditions.

That is why the Digital Door Twin project combines:

- Field data from pilot buildings
- Simplified life cycle assessment (LCA)
- A digital inventory of doors

This combination makes it possible to compare environmental impacts and to weigh up different reuse scenarios against one another.

The Digital Door Twin project: context and approach

As part of the Digital Door Twin project, Sirris, Buildwise and Kulapro investigated how the reuse of wooden doors can be systematically supported. At the heart of the project is a digital approach in which doors are **monitored** not only physically but also **digitally**.

This digital inventory contains information on, among other things, **dimensions**, **condition** and **technical specifications**, and therefore **market value**. This provides a reliable overview that makes it possible to organise reuse not on an ad hoc basis, but in a targeted and well-founded manner.

How was the environmental impact assessed?

In order to accurately assess the environmental impact of reuse, a **simplified life cycle assessment (LCA)** was used within the project. The analysis is based on a **cradle-to-gate approach**: the environmental impact of **newly manufactured doors** is compared with that of **reused doors**, including any necessary modifications. This simplified LCA was aligned with the approach used by Totem to facilitate potential integration.

One important point in this context is that:

- The figures are **indicative**, not absolute values
- They are used to facilitate **comparisons** and **rough estimates**
- They support decision-making, but do not replace project-specific analysis

What do the life cycle assessment figures show?

The good news is that the assessment shows that reusing wooden doors leads to a **significant reduction in environmental impact**. Depending on the type of door and the reuse scenario, this reduction ranges from approximately **50% to 75%** compared with manufacturing new doors.

Two factors explain these results.

1. The higher the functional value, the greater the benefits

For doors with **higher functional performance**, such as acoustic or fire-resistant doors, this impact is greater in terms of material use and new production. That is precisely why the **environmental benefits** of **reusing** are **greater**.

2. The door panel accounts for most of the impact

The analysis shows that the **door leaf itself** accounts for the largest share of the environmental impact.

Why reuse is still the more environmentally friendly option, even when using new parts

A frequently asked question is whether reuse loses its environmental benefits if new fittings, new hinges or a modified wall frame are required.

The analysis carried out in the project shows that **this is not the case**. The environmental impact of these additional components remains **limited** compared to the impact of manufacturing a completely new door.

Energy consumption and transport costs associated with inspection and preparation also account for a **relatively small** proportion of the overall balance. As long as reuse is **targeted** and **organised**, the environmental benefits remain intact. **Reuse does not, therefore, need to be perfect to remain environmentally sound.**

The door panel is therefore the hot spot in terms of environmental impact. It is important to take the right approach here.

Digital data as a lever for impact

Digitalisation plays a key role in achieving these environmental benefits in practice. The Digital Door Twin project investigated how **digital inventories** and data can help with making better choices.

Digital tools make it possible to quickly assess **which door panels are environmentally suitable for reuse**. What’s more, these tools enable you to compare reuse scenarios and support your decisions with data.

From niche to scale: why digitalisation and collaboration are crucial

The reuse of doors is still often limited to niche projects. The analysis carried out as part of the project makes it clear why: without collaboration and digital support, uncertainties and inefficiencies pile up.

Scaling up requires:

- Shared data on performance and status
- Platforms that bring together supply and demand
- Coordination between those involved in the supply chain

Digital tools help to create a unifying layer. Establishing links between those involved in: initial installation, dismantling, off-site storage, sales, logistics, local preparation for reuse and installation. The tools make it possible to ensure that reuse is not only environmentally sound but also **organisationally manageable**.

From circular instinct to impact strategy

For sustainability managers, policymakers and innovation leads, the Digital Door Twin project demonstrates above all that:

- Reusing doors yields consistent environmental benefits
- Those benefits are measurable and comparable, even using a simplified LCA
- The greatest impact relates to the door panel, not the peripheral components
- Digital support is needed to make impact-based selections
- Scaling up requires platforms and collaboration, not isolated initiatives

In this way, the reuse of doors shifts from a general concept of sustainability to a **measurable and manageable impact strategy**.

From environmental impact to business case

In this context, environmental impact and cost-effectiveness run remarkably parallel. Where reuse makes ecological sense, there is often economic scope too, and vice versa.

Also read: cost-effective reuse of doors: from circular ambition to viable business case

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