



04. An Interdisciplinary Approach to Circularity

Maximizing Resource Use and Setting Reuse Rate

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Our buildings and infrastructure mainly consist of high amounts of materials like stone, concrete, and steel. Their extraction, processing and transportation challenge the limits of our planetary resources and negatively affect the climate. To safeguard the environment for future generations, we must make a fundamental shift. *We must maximize resource use and higher-grade reuse in the construction industry and at the end of the use phase.*

Decisions and actions related to materials and resources significantly affect resource flow and management. This involves production, use, reuse, recycling, and disposal decisions that impact the entire resource lifecycle. But it's not just about gears and gadgets. It's about making smart decisions to maximize resource use while achieving specific goals. It's about optimizing material flow, implementing efficient reuse and recycling methods, and setting future ambitions.

The size of a construction or renovation project, whether it's for the entire project or a part of it, will result in material movement, which we call (resource) flows. This includes outgoing materials and incoming materials. It is important to separate stock from flow. In a circular economy, the focus is on maximizing stock preservation, which involves minimizing the generation of flows, both outgoing and incoming. In any case, the changes to the

existing stock can be quantified as a preservation rate. The reclamation rate represents the portion of disposed materials that are carefully reclaimed for reuse, and if these materials are reused on the same site, it's called the reuse rate.

The Waste Framework Directive: prioritizing reuse

Reclaiming and reusing materials aligns with regulatory principles. The *Waste Framework Directive* makes reuse and other waste prevention approaches a priority over recycling and other waste management strategies.

For example, for building owners considering demolition, it's important to conduct a reclamation audit to evaluate materials' potential for reuse. This audit ensures that identified elements are separated from demolition waste, allowing for safe dismantling and identifying potential demand for the materials while addressing harmful substances. The owners are then confronted with questions like: is there a demand for these materials? Can the materials be dismantled without damage? Are the materials likely to contain or have been contaminated by harmful substances?

In some contexts, it is possible to set a specific quantity-based reuse target. This can be done either as a qualitative, incentive-driven contractual objective or as a quantitative target. Depending on



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the approach taken, the way to establish the reuse rate may vary. In all cases, several common factors must be determined in advance. To which part(s) of the work does the reuse rate apply? Which unit(s) should be chosen? What is the expected level of detail? What is the targeted rate?

Setting reuse targets

These targets can be set according to a reuse rate for the whole project, for each building layer, or for specific batches of components.

We can set a high quantity for the target depending on the type of project and the layer in which the material is reused. In terms of setting the reuse rate for layers, the developed classification of Brand's shearing layers can be used. However, when setting goals or targets for the reuse of materials in a project, it is important to *base these goals on concrete and relevant information*. This can include data from projects, knowledge of the reuse market, prior experience of service providers, studies of possible supply channels and so on. *If there is uncertainty in these factors, it is advisable to set relatively low, achievable minimum targets for material reuse.*

In practice, obtaining complete project information can be challenging due to unresponsive organizations, data loss, and accessibility issues. In an ideal scenario, every construction material would be documented before use, and the removal of each element would be tracked. In reality, it's more practical to plan for reuse rates at the beginning of the project, especially when preparing the bill of quantities. Lastly, reuse is an approach that carries with it cultural, social, economic, and environmental aspects, which are often more

important than just quantitative aspects. The reuse rate can offer general indications with relatively light monitoring efforts, but it's essential to have a harmonized and coherent approach.