

Researchers: Demolishing buildings is bad for the planet—here's an alternative

July 23 2024, by Ana Rute Costa and Rabia Charef



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The construction industry is [not on track to decarbonize](#) by 2050 and

uses more resources than most. In 2020, the UK produced a staggering [59.1 million tonnes](#) of non-hazardous construction and demolition waste. Despite most of this material (92.6%) being recycled, much of it was crushed for use in roads and building foundations.

Why is this a problem? Downcycling, as opposed to upcycling, turns high-quality materials into lower-quality products by crushing and mixing them, preventing future use in their original form.

[Increasing the demand for natural resources](#) and continuously exploiting [raw materials](#) is unsustainable. The alternative is to reuse, repair or repurpose materials already in use. But for this to happen, buildings would need to be carefully taken apart—and their materials kept at their highest possible value.

Recycling often compromises the original properties and quality of a material. The result is that window frames, glass and bricks that could be reused end up in a landfill. For example, a structural beam can be dismantled and installed in another building. The same goes for window frames. Clay bricks can be reused instead of being crushed and recycled as an aggregate material.

Downcycling uses energy and resources to transform materials, increasing how much carbon is embedded in a construction project. Prioritizing the reuse of existing materials over recycling can significantly reduce embodied carbon—and the construction sector's carbon footprint.

Of all the buildings likely to exist in 2050, 80% have probably [already been built](#) according to one estimate. Meeting [net zero targets](#) will require these buildings to be renovated, with insulation and other measures that improve their energy efficiency. This process should preserve as many useful materials as possible.

Deconstruction over demolition

Think of buildings as material banks filled with reusable components for future construction. Deconstructing buildings instead of demolishing them—carefully disassembling and salvaging their materials for reuse—can repurpose much of what would otherwise be waste.

This strategy has been adopted in different countries. Since 2015, the French government has launched several laws and incentives [favoring deconstruction](#). The Netherlands has a [national program](#) aimed at halving the use of primary raw materials in the [construction industry](#) by 2030. [Vancouver](#) in Canada aims to reduce waste from construction and demolition and encourage the reuse of deconstruction materials. The city of Oakland in California established [a deconstruction requirement](#) that ensures that salvageable materials are identified and removed for reuse instead of being recycled or sent to landfill.

The problem, as Dutch architect Thomas Rau defines it, is that waste is [a material with no identity](#). Categorizing materials is necessary to salvage them and recognize their potential for reuse.

Existing buildings are treasures

Imagine if each material in a building had an ID: [a material passport](#) consisting of a physical label linked to a database. For example, a glass panel might have a product passport composed of different material passports [relating to the materials](#) used to make it (sand, soda ash and limestone).

A door without a material passport might go to waste. The same door with an ID has its [physical dimensions](#), materials, manufacturer information and product details documented. Such a system could

prevent these valuable materials being lost or wasted and enable their reuse as a valuable item.

The door could then be deposited in a take-back scheme, remade according to its details or simply reused straightaway. Assigning an identity to existing materials helps designers understand their physical, social and environmental value and understand their potential. In essence, these passports prevent materials from becoming an undifferentiated mass of waste, extending their lifespan and preventing their disposal.

Old buildings are more than just relics of the past, they are treasures waiting to be salvaged. Creating passports for [building](#) materials, before they are dismantled, allows them to be identified, traced, and kept in use instead of being thrown away.

Buildings and materials have not just one life, but the possibility of several.

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