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Transforming real estate for a sustainable future

Sustainable building materials and the circular economy

The real estate and construction sector is undergoing significant transformation as sustainability becomes a central priority. This includes replacing high-emission materials like traditional cement and steel with lower-impact alternatives and modern methods of construction. Embracing a circular economy approach can help reduce carbon emissions, cut waste, and enhance efficiency. These tactics can improve building performance, attracting investment, and increasing long-term real estate value.

The construction industry plays a central role in global environmental impact, both in terms of resource consumption and waste generation. One of the main contributors to this impact is the selection and use of building materials. Traditional materials such as concrete and steel are widely used due to their strength and availability, but they come with a heavy environmental cost. Cement production alone is responsible for approximately 8% of global CO_2 emissions, largely due to the chemical process of calcination and the fossil fuels used in production[1]. Steel, although recyclable, is highly energy-intensive to produce and in 2020 it accounted for between 7% and 9% of global human-derived CO_2 emissions[2].

These alternatives are increasingly regarded in the industry as contributors to lower greenhouse gas emissions, more renewable resource cycles, and improved building efficiency, including better thermal insulation and indoor air quality. The challenge is compounded by the fact that construction and demolition waste represent at least 30% of solid waste generated in the world[3]. It is often observed that materials are not typically recovered at the end of a building's life, resulting in processes that are both carbon-intensive and wasteful. This linear model—extract, use, and discard—has long been characteristic of the construction sector.

By contrast, a growing number of sustainable building materials are being developed with circularity in mind. Examples include cross-laminated timber, recycled steel, low-carbon concrete, recycled concrete aggregates, and engineered wood panels made from recycled fibers, which are designed to enhance environmental performance throughout their life cycle. These alternatives can reduce greenhouse gas emissions (i.e., each tonne of recycled steel avoids 1.5 tonnes of CO2 compared to steel produced from iron ore[4]), support renewable resource cycles, and can enhance building efficiency by providing better thermal insulation and indoor air quality.

The adoption of these materials is closely linked to the principles of the circular economy. Instead of viewing buildings as static and disposable, the circular model encourages designing for adaptability, disassembly, and material reuse. For example, there is increasing discussion around using structural elements made with recycled concrete in new construction. Similarly, agglomerated wood panels produced from post-consumer waste are often mentioned as a potential way to extend the lifecycle of timber resources.

Although traditional construction practices are still dominant, there is a gradual shift toward methods that support more efficient use of materials. Industrialized construction methods—such as prefabrication and modular design—are often referenced in industry discussions as approaches that may help with material efficiency and waste reduction. When used alongside sustainable materials, these methods are viewed in some circles as having the potential to lessen environmental impact. Digital tools, including building information modeling (BIM), are also frequently noted for their role in supporting more detailed planning, life cycle assessments, and material traceability, which can be relevant for future reuse or recycling.

Increasingly, sustainable materials are seen as a relevant consideration in project valuation from an investment perspective, developers and asset managers are increasingly considering the carbon footprint and life cycle of building materials. Incorporating certified sustainable materials is often viewed as beneficial for meeting green building certification requirements, such as Leadership in Energy and Environmental Design (LEED) or Building Research Establishment Environmental Assessment Method (BREEAM), and for enhancing appeal to tenants and investors. Recent trends indicate that this shift is especially relevant in European countries, where the real estate and construction sectors are beginning to accelerate the transition toward more sustainable practices. For example, 56% of European real estate and infrastructure companies confirm that lower-emission concrete is part of their carbon reduction strategy for addressing Scope 3 emissions[5]. However, despite growing interest, there is still a gap between pilot projects and widespread adoption—particularly when it comes to integrating circular material strategies in public tenders and mid-scale developments.

Financial instruments such as bonds or sustainability-linked loans are often tied to measurable sustainability outcomes, including the use of low-carbon materials. Developers who prioritize circular material strategies may access preferential financing and align more easily with institutional investors seeking sustainability-aligned assets. Moreover, tools such as digital material passports can offer transparency in sourcing and help facilitate responsible resource management, further enhancing investor confidence.[6]

In conclusion, shifting away from high-emission, linear material use in construction toward a model based on sustainability and circularity is important and possible with today's technologies and materials. By choosing low-impact alternatives and embracing the principles of reuse and regeneration, the construction sector can reduce its environmental footprint and help build a more resilient future.

Building the future responsibly begins with the materials chosen today.

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Endnotes:

1. "Cement is a big problem for the environment. Here's how to make it more sustainable", *World Economic Forum*, 13 September 2024.
2. "Climate change and the production of iron and steel", *World Steel Association*, 2025.
3. "The circular economy in the construction and demolition waste management: A comparative analysis in emerging and developed countries", ScienceDirect , 1 November 2023.
   "24 Construction Waste Statistics & Tips to Reduce Landfill Debris", *BigRentz*, 26 February 2024.
4. "Climate Change and the production of iron and steel", *World Steel Association*, 2020.
5. "Survey for Real Estate, Infrastructure, Manufacturing and Energy sectors", *Climate Group and Ramboll*, 2024.
6. "What are material passports and the benefits of using them?", *UK Green Building Council*, 7 June 2024.

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