



Up2Circ – Boosting the Uptake of Circular Business Model, Product and Process Innovation

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Sectorial Catalogue Construction




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Contents

SHORT INTRODUCTION	3
CIRCULAR ECONOMY OPPORTUNITIES FOR THE SECTOR	3
OVERVIEW OF TECH-SAVVY SMES THAT DEVELOP/OFFER SOLUTIONS	5
LINKS TO SECTOR SPECIFIC ONLINE CONTENTS	8



	Up2Circ – Boosting the Uptake of Circular Business Model, Product and Process Innovation	
	SECTORIAL CATALOGUE – CONSTRUCTION	Page 3 of 8

Short Introduction

The construction sector stands as one of the pillars of the European economy, contributing significantly to the region's GDP and employment. It's intertwined with multiple industries like manufacturing, services, and raw materials. With the European Green Deal's ambition to make Europe climate-neutral by 2050, the construction industry is poised to play a critical role, especially since buildings account for about 40% of the EU's total energy consumption. [Moreover, the construction and demolition waste makes up just over one third of total waste generation in the EU and according to a European Environment Agency \(EEA\) briefing published today, circular approaches are key to increasing the quality and quantity of recycling and reuse of construction and demolition materials.](#)

The construction sector stands at a pivotal juncture, grappling with pressing sustainability concerns that have far-reaching implications. As urbanization and infrastructure development continue to surge, the industry faces a myriad of challenges that underscore the urgent need for eco-friendly practices and innovations. Here's a closer look at some of the most pressing sustainability challenges confronting the sector today:

- **Waste Generation:** Construction and demolition produce large amounts of waste, often disposed of in landfills.
- **Resource Intensity:** The industry is heavily dependent on raw materials, some of which are finite and face depletion risks.
- **Carbon Emissions:** Construction processes, materials production, and building operations contribute to significant CO2 emissions.
- **Regulations:** The EU's Circular Economy Action Plan and the Construction Products Regulation (CPR) impose standards to encourage sustainability in the sector.

Circular Economy Opportunities for the Sector

As the global push for sustainability gains momentum, the construction sector is uniquely positioned to embrace transformative practices that not only mitigate environmental impacts but also drive economic value. The circular economy presents a blueprint for this transformation, offering innovative strategies that redefine how we design, build, and repurpose. Here are some promising circular economy opportunities that the sector can harness to pave the way for a more sustainable future:

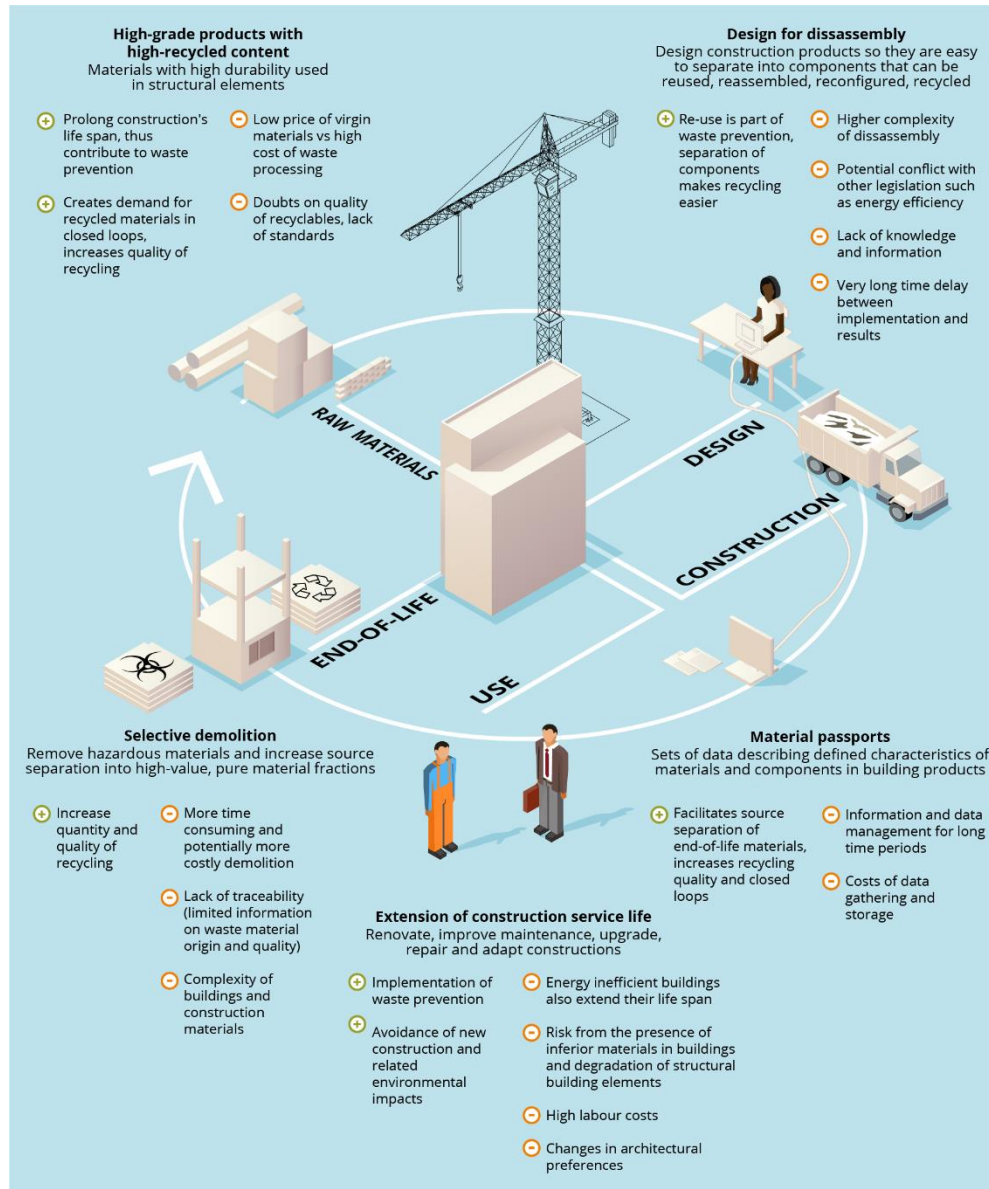
- **Recycling and Upcycling:** Reuse of materials from demolished structures, converting waste into valuable resources.
 - **Brick Salvage:** In many urban renewal projects, old bricks from demolished buildings are cleaned and reused in new constructions, preserving the aesthetic of the area.
 - **Reclaimed Wood:** Old wooden beams, flooring, and furniture are often repurposed into new designs, reducing the need for new timber.



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- **Glass and Metal Recycling:** Old windows, aluminium sidings, and metal fixtures are melted down and reshaped into new products.
- **Modular and Prefabricated Construction:** Reducing waste by manufacturing building components off-site.
 - **Shipping Container Homes:** Repurposing old shipping containers into modern, stylish homes and offices.
 - **Pre-made Walls and Roofs:** Manufacturing walls, roofs, and even entire rooms in a factory setting, then transporting them to the construction site for assembly, ensuring precision and reducing waste.
 - **Modular homes:** Modular homes are completed in sections called modules, according to specific plans. These sections are then transported to the site where they are assembled by builders and installed into the foundations.
- **Green Building Design:** Designs that focus on energy efficiency, water conservation, and other sustainability metrics.
 - **Rainwater Harvesting Systems:** Designing buildings to collect, store, and use rainwater, reducing the reliance on municipal water supplies.
 - **Green Roofs:** Planting vegetation on rooftops to provide insulation, absorb rainwater, and combat the urban heat island effect.
 - **Solar Panel Integration:** Incorporating solar panels into the design to generate clean energy and reduce electricity bills. **Best Practices:** The use of Building Information Modelling (BIM) to optimize material usage, Netherlands' Madaster, a 'material passport' platform, ensures optimal material use and reuse.






Source: [Improving circular economy practices in the construction sector key to increasing material reuse, high quality recycling — European Environment Agency \(europa.eu\)](#)

Overview of Tech-savvy SMEs that Develop/Offer Solutions

In the dynamic landscape of the construction industry, a new breed of SMEs is emerging, characterized by their technological prowess and commitment to sustainability. These tech-savvy enterprises are not just adapting to the circular economy; they are at the forefront, pioneering

	Up2Circ – Boosting the Uptake of Circular Business Model, Product and Process Innovation	
	SECTORIAL CATALOGUE – CONSTRUCTION	Page 6 of 8

innovative solutions that redefine the very essence of construction. From harnessing digital tools to developing eco-friendly materials, these SMEs are setting new benchmarks and shaping the future of circular construction. In this section, we delve into an overview of these trailblazing entities and their transformative offerings.

[REBETONG](#)

Skanska has developed recycled concrete - rebetong. It replaces 100% of construction rubble with natural aggregates for concrete production. In addition to the benefits mentioned above. This brings with it lower material and transport costs, support for obtaining credits in LEED and BREEAM certification, a reduced carbon footprint and buildings with lower energy consumption due to a lower thermal conductivity coefficient. With ERC-Tech, they have thus developed an endless material cycle. In fact, Rebeteng can be reused at the end of the building's lifetime.

[REFAGLASS](#)

Recifa, a waste collection company in Příbram, had a surplus of packaging glass from white and green containers. Shards of glass are crushed into glass powder and mixed with finely ground carbon dust. The mixture is heated to a temperature of 1000 °C. The glass is melted and the solid carbon microparticles are oxidised to carbon dioxide gas. This forms microscopic bubbles in the material, which increase the original volume of the crushed glass many times over. And not only is it a clean, eco-friendly material, but it is also 4 times cheaper than conventional polystyrene foam. It is waterproof, non-flammable, dimensionally stable, odourless, frost-resistant, resistant to biological damage by bacteria or disturbance by insects or rodents, it is also resistant to mechanical stress, and it does not transmit any gases or vapours. It also has a very high durability and is 100% recyclable back to the original starting material - glass. It is therefore mainly used as an insulator. For the record, it takes about 25,000 wine bottles to insulate the foundation of a house.

[KNAUF INSULATION](#) has officially opened a new €15 million Glass Mineral Wool recycling facility in Visé, Belgium, paving the way for an exciting new recycling service for the construction and deconstruction industry.

[ECOPHON](#) - Saint Gobain also believes in sustainability and recycled materials. Their Ecophon acoustic ceilings and panels are made up of glass wool, which is made up of more than 80% recycled domestic glass. And the waste material from manufacturing is then recycled into a drainage called EcoDrain™. This is used to level the ground and replace the demand for sand.

[SUBSTABIT](#) was developed by the family company Ciur from Brandýs nad Labem. The basis is PVB = polyvinyl butyral, which is obtained from recycled films from car safety glass and from safety glass from high-rise buildings. A layer of sub-base is placed 10 cm below the road surface, replacing up to 30% of the asphalt in new road construction (about 500 tonnes of oil are saved per 1 km of motorway). It makes it more durable with less rutting and better temperature sensitivity.



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	Up2Circ – Boosting the Uptake of Circular Business Model, Product and Process Innovation	
	SECTORIAL CATALOGUE – CONSTRUCTION	Page 7 of 8

RED-BETON is a Czech firm based in Brno that offers solutions for the efficient processing of construction and demolition waste, including concrete, brick, and mixed materials. They produce high-quality concrete using up to 100% recycled aggregate, showcasing a commitment to circular economy principles in the construction sector. Their innovative approach not only conserves natural resources but also results in concrete with superior properties compared to those made from natural aggregates

KOMA Modular is a leading Czech company specializing in modular construction. Based in Vizovice, they focus on sustainable and innovative solutions, emphasizing the importance of circular construction. Their approach combines high aesthetic standards with functional value, ensuring that each modular structure is not only efficient but also environmentally friendly


NEMA is a Czech company specializing in the production of bound roofs, trusses, roofing panels for brick buildings, and a wide range of timber construction panels designed for prefabricated timber buildings. With unparalleled quality, unique service, technical support, and flexibility, they are a sought-after supplier for hundreds of commercial, construction, and implementation companies. Their commitment to sustainable and innovative solutions is evident, emphasizing the importance of circular and ecological approaches in construction.

Progresus is an international investment group that manages a diverse portfolio of innovative companies and projects. A significant focus of their operations is sustainable development, both residential and industrial. They invest in sustainable companies and projects with a higher purpose, emphasizing the importance of CO2 neutrality, sustainable materials, and eco-friendly construction. Their mission revolves around positively impacting the stories of everyone involved, from investors to the communities they serve.

Cementum is a Czech-based company that specializes in the design and production of sustainable concrete products. They emphasize the use of 100% recycled aggregate in their concrete, aligning with the principles of the circular economy. By recycling old concrete and conserving natural resources, Cementum not only reduces CO2 emissions but also produces products with the same technical parameters as those made from natural sources.



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	Up2Circ – Boosting the Uptake of Circular Business Model, Product and Process Innovation
	SECTORIAL CATALOGUE – CONSTRUCTION

Page 8 of 8

BÜSCHER

Another example from Germany. A company developed a certified concrete made of recycled construction and demolition waste. Two challenges are responded to at the same time. Waste is reduced and material for new buildings is saved. Plus, another perspective – used material is kept longer inside the circle.

Links to Sector Specific Online Contents

- **EU Circular Economy Action Plan:** <https://ec.europa.eu/environment/circular-economy/>
- **ECCP Resources for Construction:** <https://www.eccp.eu/>
- **Sector-specific Funding Opportunities:** For sector-specific funding opportunities related to sustainability in construction you can explore the [EU Funding & Tenders Portal](#).

