

»» Sustainable construction – Foundation for climate-friendly urbanisation

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No. 14, 30 October 2020

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Cities matter

The global population is growing, with around 200,000 people moving to urban areas every day. This increasing rate of urbanisation is associated with high demand for residential buildings, transport networks, and social and economic infrastructure. At the same time, cities are already the main driver of man-made climate change. Over 70% of global greenhouse gases are emitted in cities. Since 6 billion people are expected to live in cities instead of 4.2 billion by the middle of the century, emissions of gases harmful to the climate and the use of land and resources are expected to increase – unless current practices change. It has thus become even more important to build sustainably. Sustainable construction will be the critical factor if achievement of the 2030 Agenda and the Paris Agreement are to be successful.

The building sector leaves a large climate footprint

The building sector, in particular, is considered one of the main contributors to anthropogenic climate change. Around 30% of all extracted raw materials and close to 40% of global energy consumption and associated carbon emissions are attributed to the construction, maintenance, and operation of buildings. Cement production alone is responsible for 8% of global carbon emissions. To achieve climate targets, the world needs a sustainable building industry that minimises the footprint of building shells while improving the efficiency of energy consumption within them.

Important: the right materials

Construction materials play a significant role, as cement, steel, aluminium and plastic are responsible for most carbon emissions in the building sector. Using renewable and recyclable resources is therefore recommended to optimise the environmental footprint.

An alternative to cement is solid timber construction – typically readily available locally. Due to its stability, wood is well-suited for frame construction, even for buildings with several floors. The carbon remains bound in the construction material and is only released later, after serving its initial purpose, when it is either burned as heating fuel or rots. Bamboo is also considered a future-proof building material because it grows back faster than wood and has a high load-bearing capacity.

Along with wood, materials like natural stone, clay, straw, cellulose, lamb's wool and hemp are used for construction. In traditional construction methods, sustainable building materials are often used automatically because they are available in the direct vicinity and tend to be natural materials. For example, clay is an extremely low-emission material; it does not need to be heated and often does not need to be transported over long distances due to local availability all over the world. While wall construction using prefabricated reinforced concrete slabs requires energy input of 900 MJ/m², energy needed for a rammed earth wall is just 43 MJ/m². Moreover, higher demand for local building materials not only reduces transport routes,

but also stimulates local economic cycles.

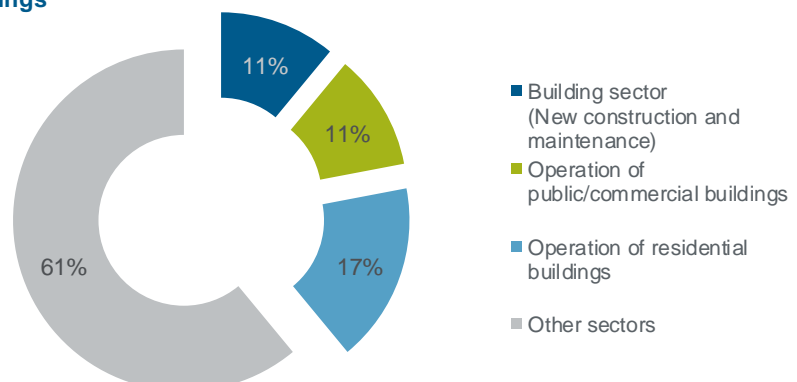
Recycling building materials

The recycling of materials still happens too rarely. This is the case despite the fact that recycling glass from windows would save 96% of carbon emissions, while using construction waste to produce new bricks would save 30%. Even recycled concrete has the potential to save 7–10% of carbon emissions, despite that it is only possible to replace the gravel element and not the higher-emission cement element. However, to date only less than 1% of demolished concrete is recycled at the same level of quality. In short: there is still a lack of future-proof recycling approaches in the building sector.

Conclusion: promote transformation in the building industry

Sustainable construction plays a key role in climate protection – not least due to the building boom across the globe. However, this potential is still starkly underutilised. Beyond the construction industry, policy makers and development cooperation must also act. They need to promote a global transition in the building industries of partner countries, with measures that include new concepts, technical innovation and financial incentives. ■

Percentage of global energy-related emissions produced by buildings



Own data. Data source: UNEP (2018).