

CLIMATE AND CIRCULARITY IN THE BUILDING AND HOUSING SECTOR

Connecting SWITCH-Asia activities and
sharing our insights

The housing and building sector is critical for an economic transformation that respects planetary boundaries

The building and housing sector is among the most resource-intensive and economically important sectors globally. Drastically reducing the emissions of buildings and construction is decisive for achieving the below 1.5 degrees Celsius ambition set forth in the Paris Agreement.

This sector is unique also in its importance: adequate housing is a basic human need, and the United Nations (UN) has declared it to be a human right. Social and development agendas, nationally and globally, prioritize the provisioning of housing.

From an individual's perspective, housing is one of the key determinants of perceived quality of life that also shapes numerous other decisions; these, in turn, influence the environmental footprint of societies. The built environment – building typology, materials used, resources required for operation and maintenance, the infrastructure it relies on – influences development for decades to come. Decisions today can “lock in” decision-making for generations, for example, with regard to car dependency or land use, including biodiversity and green spaces. For all these reasons, the housing and building sector is critical for an economic transformation that respects planetary boundaries and is a keystone topic of Sustainable Consumption and Production (SCP).

The significance of the sector is emphasized by the UN Sustainable Development Goals (SDGs) and the New Urban Agenda (NUA), where adequate housing is a key policy goal and commitment. This priority must align with other SDGs, particularly SDG 11 on “Sustainable cities and communities,” SDG 12 on “Responsible consumption and production,” and the Paris Agreement to counter climate change.

Climate change and the building sector

In the transition to a low-carbon, resilient, and sustainable society and economy, buildings and construction activities play a critical role in energy use and are the biggest sources of greenhouse gas emissions. They are responsible for more than 38% of global energy-related CO₂ emissions, higher than any other sector (UNEP, 2020). This is due to several factors, some of which relate to emissions associated with using buildings – for example, space heating and cooling or the use of electrical appliances and lighting – largely defined at the design and construction phases. A significant part of emissions comes from embodied or “upfront” carbon emissions; materials, such as cement, steel, and plastics; another from construction processes along building lifecycles (World Green Building Council, 2019). At the moment, more than 11% of global annual carbon emissions are generated by construction, renovation, and demolition.



A Case in Point: Optimizing Facility Management and Maintenance for Climate Change Mitigation

Facility management and maintenance are critical components of the building and housing sector's Sustainable Consumption and Production (SCP). They ensure building operational efficiency and lifespan, which saves resources and decreases environmental impact. Facility managers, for example, can optimize energy use by implementing smart building technology such as Building Management Systems. These technologies monitor and regulate systems for heating, ventilation, air conditioning, and lighting to optimize conditions and reduce energy use.

SCP can also be influenced by maintenance actions. Regular heating, ventilation, air conditioning system tune-ups and the early installation of energy-efficient lighting can help avoid significant repairs, minimizing material consumption and waste. Green cleaning procedures also result in better interior environments while reducing negative environmental effects. Importantly, these facility management segments are key employment generators, promoting neighbourhood development. Energy auditors, technicians, and facility managers all play important roles in keeping buildings valuable and functional. These occupations benefit not only local economies but also skill development and community resilience.

Furthermore, facility management can make it easier to integrate new technologies into old structures. Photovoltaic solar panels and green roofs can help cut energy use and enhance thermal insulation, contributing to a circular, low-carbon economy.

EU Priorities: Buildings and Housing

To be at the forefront of innovations and to guide and incentivize private sector actors, the EU has put forward legislation, including its Construction Products Regulation (CPR, starting in 2014). It also emphasizes the importance of building and construction for the green transition in its flagship Green Deal (2019). The EU further prioritizes this sector in its new Circular Economy Action Plan adopted in May 2020. As the building and housing stock in Europe is not expected to grow as dynamically as in Asia, one of the focus areas for the EU is the renovation of existing buildings for increased energy efficiency, through its “Renovation Wave” strategy (2020), which prioritizes social housing. In addition, to recognize the comprehensiveness of the topic, more holistic approaches for a green transition of “the built environment” in its entirety, rather than focusing on buildings and construction, are being explored. In its “New European Bauhaus” initiative (2021), the EU connects the European Green Deal to living spaces by involving multiple stakeholders to envision a sustainable and inclusive future, going beyond buildings and towards societal transformation.

Putting these strategies into action, in 2022, the EU Commission proposed a revision to its Construction Products Regulation, introducing environmental, functional and safety product requirements for construction products. The same year, the EU Council also agreed that “from 2028 new buildings owned by public bodies would be zero-emission buildings” and that from 2030 all new buildings would be zero-emission buildings.

Circularity and the building sector

In the past, the focus for transforming the building sector has been on energy efficiency and renewable energy supply. Equally important is building circularity, in addition to moving away from fossil fuels. This prioritizes the minimization of materials use at all stages of the building life cycle and emphasizes the return of materials into the production and consumption cycles – actions that directly impact emissions over the long term. Building and construction are responsible for an estimated 50% of the total use of raw materials (IEA 2019 Global Status Report for Buildings and Construction).

By extending the lifespan of buildings and eliminating waste through making their materials circular, energy and virgin material requirements, as well as wastes and emissions, are minimized. As a concept, the circular economy goes even further by considering the health of humans and natural systems as key aspects of “true” circularity. In this broader perspective, the building sector is assessed from the standpoint of its impact on ecosystem regeneration. This approach considers not only greenhouse gas emissions but also material flows and resource efficiency (including water) across the lifecycle, the minimization of harmful materials use, land use, and nature and ecosystem health. It also focuses on the efficient utilization of assets and seeks to create efficiency and effectiveness in products and materials. A key indicator in this context is the calculation of full lifecycle costs per unit of output, including externalities.



A Case in Point: **Optimizing Facility Management and maintenance for materials circularity**

Using locally sourced materials for repairs and maintenance, for example, can reduce environmental impacts while supporting local economies. Even simple procedures like promptly addressing leaks, maintaining the structural integrity of the structure, and using light-reflecting colors for painting can improve the longevity and energy efficiency of a home.

Regular maintenance of low-tech alternatives such as solar lights or biomass stoves can ensure sustained functionality and lifetime in areas where power supply is unstable. Similarly, basic rainwater collecting systems and composting units can contribute to resource efficiency and waste reduction.

Equal to high-tech facility management, these maintenance efforts also have the potential to create local job opportunities. Occupations ranging from masons and carpenters to technicians who maintain solar systems can promote local economies, enable circular models, and develop resilience. In conclusion, even in modest dwelling settings and in developing nations, facility management and maintenance are critical to fostering Sustainable Consumption and Production.

The entire housing value chain can and must be revolutionized on this basis: to create a truly circular building sector, “closing loops” of resources is prioritized around its lifecycle, so that they are not lost or wasted. This new building future would allow for flexible use and modular design of buildings, optimized for durability and high utilization – where building cores allow for a change of use, for example, from residential to office or service space. Materials would be non-toxic, renewable, and reusable, and building design would

consider nature and ecosystems regeneration as well as health and human needs. Increased reliance on renewable materials such as sustainably-harvested bamboo and wood can also sequester carbon over time, contributing to emissions reduction strategies. The sector would support zero-waste, circular lifestyles, thereby regenerating and restoring natural capital and strengthening systemic resilience.

SWITCH-Asia activities

The European Union (EU) SWITCH-Asia Programme serves as a platform for partnerships and networks between Europe and Asia, facilitating the implementation of national strategies and action plans on Sustainable Consumption and Production (SCP). With support from the European Commission, Asian countries are guided in transitioning towards low-carbon and resource-efficient economies that prioritize circularity, enhancing citizen well-being and quality of life. This briefing establishes a connection between SWITCH-Asia activities on climate and circularity within the building and housing sector.

Partnerships between Asian countries and the EU can provide mutual inspiration and create shared expertise. By collaboratively exploring how housing and buildings can contribute significantly to the transition to circularity and SCP, professionals from Asia and the EU can identify shared visions for the future and refine their local implementation priorities. This collaboration can result in action on technological innovations as well as governance, and include human-centered urban planning, infrastructure, and technology.

The EU, in general, and its SWITCH-Asia programme, in particular, recognize the critical importance of this sector in promoting sustainability through SCP, making the construction, housing, and buildings cluster a major pillar of their activities. This is achieved through technical assistance provided by the Policy Support Component (PSC) at the government level and through the Grants Programme in support of the region's SCP-relevant entrepreneurs and SMEs.

Since 2007, the SWITCH-Asia programme has implemented 15 grant projects contributing to Sustainable Housing in South Asia, Southeast Asia, and East Asia. The programme has also provided technical assistance to Pakistan for developing a green building code and to Kyrgyzstan on promoting energy efficiency in the construction sector. It has supported the Government of Bangladesh by providing policy support for green buildings. Additionally, SWITCH-Asia partners with organizations focusing on housing and has commissioned "SCP Awards" as part of the Asia Pacific Housing Forum in partnership with Habitat for Humanity.

SWITCH-Asia aims to contribute to connecting circularity and climate change mitigation, defining pathways for circular, low-carbon economies that prioritise the wellbeing of their citizens.

SWITCH-Asia is working with stakeholders in our Asian partner countries towards an integration of sustainable materials, energy-efficient designs, and issues like maintenance and facility management into their building legislations. This approach not only reduces the carbon footprint of buildings during construction and prolongates their use phase, it also promotes the reuse and recycling of building materials, thereby "closing the loop" both for material extraction and shifting energy consumption and production towards Paris compatibility.

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Important insights for policymakers for a circular, low-carbon building sector:

- ✓ Acknowledge the importance of sector circularity for achieving climate commitments, and the system-approach of sector policies, finance, and supply-chain regulation needed for fast results and lasting scale-up of sustainable solutions.
- ✓ Be aware of different instruments and tools that are available, for example as building codes, but also by incentive-setting as part of long-term climate strategies that foster innovation and new partnerships. Pricing in the cost of carbon emissions and virgin materials would change key variables for the sector.
- ✓ Consider the entire lifespan of buildings and recognising the importance of maintenance for efficiency and durability of housing stock and citizen wellbeing. Mandating upkeep and setting up of locally anchored monitoring and advisory to achieve high-quality, low-emissions, efficient and durable living spaces.
- ✓ Make use of metrics to track building impacts, in particular with regard to GHG accounting and material use, are of high relevance. Methodologies need to be based on scientific insights.
- ✓ Scaling up of existing solutions, while being mindful of the importance of stakeholder involvement in the design and planning phases, particularly housing.
- ✓ Awareness of housing needs and the important role the built environment plays for daily life and wellbeing of citizens at the micro level, and an economic transformation towards sustainability at the macro level.

Points of action for builders and construction companies:

- ✓ Be aware that the framework that your business is operating in will have to change, and potentially, this will happen fast. Be among the pioneers that integrate sustainability into your business case for gaining a strategic advantage. Promote transparency and share success stories of your sustainability commitments, starting with your first sustainability report to your clients and employees.
- ✓ Where possible, use digital tools to optimize design, construction, and maintenance operations. Look for “simple” apps to monitor noise, light, material safety, etc. Make lifecycle assessment (LCA) a standard practice for all projects. Request (basic) LCA data from your suppliers and form alliances with suppliers who share sustainability.
- ✓ Collaborate with educational institutions to promote sustainable building training. Provide your expertise in exchange of skilled, future-minded workforce that is capable of developing and implementing solutions that integrate sustainability considerations.
- ✓ Form alliances with construction and building product manufacturers and waste management firms to ensure sustainable design, and proper construction waste disposal and reuse. Utilize already gained initial LCA knowledge for further optimization.
- ✓ Cooperate with banking and insurance sector to create products that finance your sustainable construction projects. Make data available regarding how sustainability integration has reduced risks for your investors and future-proofed your business.

Important points of action for you and your family:

- ✓ Recognise your home and neighbourhood as one of the most important aspects in your life, and invest your time to improve it! Taking responsibility towards a sustainable future brings you together with like-minded people and helps to be engaged in solution-finding, rather than stress about the future.
- ✓ Prioritize improvements for energy efficiency and sustainability, for example through better insulation, efficient water fixtures, lighting and appliances, strategic shading, and favoring renewable, bio-based materials. This also results in long-term cost savings.

- ✓ Invest in or lobby for building maintenance and continuous upkeep. By making sure that building systems, like heating and cooling, operate at peak efficiency, carbon emissions are minimized. Well-maintained buildings have a longer lifespan, reducing the need for resource-intensive renovations or rebuilds. This also helps in identifying and addressing any structural issues early.
- ✓ Get involved regarding shared renewable energy systems (solar panels, community wind turbines, etc.). A communal approach to renewable energy not only reduces the carbon footprint of the entire community but also can be more cost-effective, as the shared cost and benefits make sustainable energy more accessible to all residents.
- ✓ Engage with local governments for walkable, green neighborhoods to improve your quality of life and health. Pedestrian-friendly areas encourages use of public transportation, reduce carbon emissions, and enhance community well-being and social connections. In addition, community gardens and repair workshops promote a culture of reusability and self-sufficiency.



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