



Making Concrete Change: Strategies for Carbon Reduction in Urban Development

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Despite an increase in energy efficiency investment, the construction sector's energy consumption and CO₂ emissions have rebounded to an all-time high. Buildings currently contribute 39% of global energy-related carbon emissions – 28% from operational needs like heating and cooling, and 11% from construction materials.

In the next three decades, with the global population expected to reach 9.7 billion, the construction industry will face the pressure to meet growing infrastructure and housing demands while adapting to stricter environmental regulations.

The urgency of climate action demands that governments mandate low-carbon practices in urban development.





Increase Use of Low-Carbon Materials

Traditional building materials like concrete, steel, and brick are strong and durable but environmentally costly. This high embodied carbon footprint is prompting a shift towards low-carbon alternatives.

- ◁ [Indonesia is using 'green cement'](#) – made using environmentally friendly materials – in the development of its new futuristic capital Nusantara. This has led to an estimated reduction in carbon emissions of up to [38% per tonne](#) of cement so far.
- ◁ Nordic countries are setting ambitious targets for low-carbon materials. Starting in 2025, [Finland will require life cycle assessments](#) and material declarations in construction to reduce emissions, detailing building components and material origins. [Denmark is also prioritising low-carbon materials](#) through energy-efficient designs, sustainable materials, and stringent building codes.



Mandate Whole-Life Carbon Emission Assessments

Whole Life-Cycle Carbon (WLC) emissions encompass all the carbon a building generates throughout its lifespan, from material extraction to demolition and disposal. Assessing WLC gives a comprehensive understanding of a building's total environmental impact.

[The London Plan](#) is a roadmap for future development and achieving the goal of a zero-carbon city. The plan includes provisions for WLC analysis, specific energy hierarchies, and strategies to reduce London's carbon footprint.

With a bold vision of a fully circular city by 2050, the [Amsterdam Circular Strategy 2020-2025](#) lays out a comprehensive roadmap to achieve this goal. Key elements include mapping material flows to reduce reliance on virgin resources and mandating WLC assessments.



Enforce Clean Construction Standards

From green building codes to tax incentives, governments around the world are implementing innovative strategies to encourage sustainable building practices.

- ➔ [The Philippines' National Building Code](#) requires green building standards and energy efficiency measures for new buildings.
- ➔ [Seattle offers expedited permits](#) for projects meeting embodied carbon standards, speeding up eco-friendly construction, and reinforcing the city's environmental goals.
- ➔ [New Jersey offers businesses](#) a tax credit of up to 5% for using low-carbon concrete and an additional 3% for concrete made with carbon capture technology.





Promote Large-Scale Adaptive Reuse

Large-scale adaptive reuse includes reducing carbon emissions by making existing buildings and infrastructure a larger part of the climate solution.

[London's Battersea Power Station](#) restored its iconic chimneys and Art Deco façade, transforming it into a vibrant hub with residential, commercial, and leisure spaces.

[The High Line in New York](#) has been transformed into a public park with innovative landscaping, smart irrigation, and interactive art installations, enhancing visitor experience and sustainability.

Singapore using adaptive reuse to rejuvenate urban and industrial spaces sustainably. [The Jurong Town Corporation](#) is repurposing a terrace factory for sustainable redevelopment and preserving industrial heritage. [In Queenstown](#), historical buildings in Tanglin Halt are being reused to maintain historical significance and add senior-friendly amenities.





Establish Circular Economy

As cities worldwide start exploring ways to go circular, some are already looking into different ways to leverage innovative practices to implement circular initiatives.

- ◁ [Toronto is embedding circular criteria](#) into procurement by requiring circular economy profiles, vendor action plans, and encouraging circular design for parklets. The city also recommends actions for transitioning to a circular economy and is developing e-learning on circular procurement for staff.
- ◁ [Japan uses Building Information Modeling](#) to optimise resource consumption and reduce waste during construction, with a focus on using recycled materials to promote sustainability in building projects.





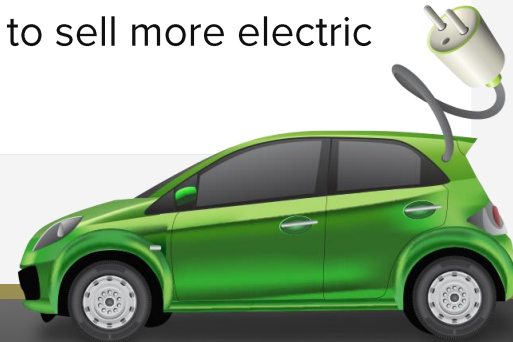
Adopt Electric Vehicles

The share of EVs increased from [4% in 2020 to 18% in 2023](#) and is expected to grow in 2024. This trend reflects a global shift toward cleaner transportation, driven by technological advancements and rising environmental awareness.

[The Delhi EV Policy](#) aims to expand charging infrastructure and incentives, targeting 18,000 charging points by 2024, with 25% EV registrations and one charging outlet per 15 EVs citywide.

[Singapore is adopting EVs to reduce land transport emissions](#) as part of its net-zero goal, aiming to cut emissions by 1.5 to 2 million tonnes. The EV Roadmap targets cost parity with internal combustion engine (ICE) vehicles and 60,000 charging points by 2030.

[Australia has set new rules](#) to limit vehicle pollution, encouraging car makers to sell more electric vehicles and reduce transportation pollution.





Promote Circular Economy Marketplaces

Circular marketplaces play an important role in the new economy, changing the way we use, manufacture, and purpose materials and products.

- ➔ [**The UK's Material Reuse Portal**](#) aggregates surplus construction materials post-deconstruction, offering guidance and connections to service providers. It integrates with various data sources, can be customised for different locations, and provides free access to sustainable materials. Future plans include expanding marketplace partnerships to enhance material reuse.
- ➔ [**Build Reuse**](#) is a US-based online marketplace specialising in salvaged and surplus building materials. It connects buyers and sellers for reclaimed items like wood, bricks, fixtures, and architectural elements, promoting resource efficiency and reducing construction waste.





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