The industry's inconvenient truth

We can't just afford to build greener, we must build less, argues Johannes Novy

In an article for *The Conversation*, Johannes Novy, Senior Lecturer in Urban Planning at the University of Westminster, discusses why building greener may not be an effective solution for cutting global emissions.

When the built environment took centre stage at the 2021 United Nations Climate Change Conference in Glasgow, the scale and urgency of the climate crisis and of the industry's responsibility to address it came into focus. A recent report from the UN's Global Alliance for Buildings and Construction shows that the buildings and construction sector is responsible for 38 per cent of global CO2 emissions.

Increasing attention has been paid, in recent years, to emissions resulting from how our buildings are operated: how they are heated, cooled and lit. Those due to the production and supply of building materials and the construction itself have received less attention. And yet, they alone account for approximately 10 per cent of global emissions.

Much of the sector thrives on a wasteful cycle of demolition and new builds. In the UK alone, an estimated 50,000 buildings are torn down each year. Which begs the question: is building greener really the solution?

Whole-life carbon approach

Despite efforts by the likes of sustainable architecture pioneer William McDonough and organisations including World Green Building Council, breaking this demolition and new-build cycle has proven difficult.

Reusing existing building stock is a complex issue. If not done sustainably, it can also cause a hike in emissions. But there are several other reasons why reuse has not become more of a default option. Many architects have found that it was easier to make a name for themselves with glitzy new buildings than with sustainable design methods and retrofits, and, frequently, more - and quicker – money could be made by tearing down existing buildings and replacing them. Perverse financial incentives play a role alongside other factors: in the UK, for example, VAT rates still encourage new builds and penalise renovations.

Further there are economic incentives for those who profit from the current system – who sell construction materials, carry out demolitions or whose business model exclusively focuses on new builds, instead of reckoning with existing buildings, refurbishing them and integrating them into new schemes – to not do things differently.

Lastly, in architecture education and professional accreditation, as elsewhere, there has been a lack of climate literacy. This has left architects ill-prepared to effectively tackle the climate crisis.

Recent initiatives show that things are changing. Architects Climate Action Network and Architects Declare launched in 2019, are just two of several alliances that aim to raise awareness within the built environment professions of the climate crisis, decarbonise the sector and drive the shift towards renewable and green building. In addition, Architects' Journal, for example, started the RetroFirst campaign in 2019, which advocates for prioritising retrofitting over demolition and new construction. As the latter campaign puts it, the greenest buildings are those that already exist.

In September 2021, a report published by the Royal Academy of Engineering drew further attention to the environmental costs that the industry incurs and possible ways to address them. Central to this new way of thinking about construction is what architects and developers call a whole-life carbon approach.

Building greener

The whole-life approach considers a building's entire life cycle, from construction, occupation and renovation to repair, demolition and disposal. In a typical UK housing block, emissions attributable to construction and maintenance account for 51 of the building's total carbon emissions.

Making buildings energy efficient to operate has long been a priority. But in most places, government policies for low or zero-carbon buildings still do not fully – if at all – consider the so-called hidden or embodied emissions. These result from the extraction and production of building materials, such as cement, and the construction process itself. Green-building certification schemes too have long overlooked them.

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Buildings today are usually built to last notably shorter periods of time than they used to be. If the typical lifespan of a traditional building of stone, brick and timber saw first repairs needed after 60 years, modern buildings have deteriorated twice as fast. Significant carbon savings could be achieved by returning to more robust and adaptable construction.

When the built-to-last principle proves impractical, however, buildings designed for a shorter lifespan can still be made more sustainable, provided a whole-life carbon approach is adopted and the components and materials used are easy to dismantle and reuse.

A surge in innovation in recent years has seen a rise in the use of wood and other bio-based materials and sustainable design principles, from the circular economy to the idea of "cradle-to-cradle" production and manufacturing, which defines waste as a resource and aims to perpetuate recycling. L'Innesto in Milan, for example, has been promoted as a showcase for the city's sustainability strategies, and is set to be Italy's first zero-emissions social housing. This project ticks all kinds of boxes: construction will involve minimal soil excavation and bio-sourced building materials with lots of greenery and very little space for cars. Internal heating systems will be powered by renewable energy sources – and more.

The problem, though, is that even L'Innesto will only be fully carbon-neutral 30 years after its construction. The project, like many others, relies on carbon offsetting to achieve its zero-carbon credentials. When the French architects Anne Lacaton and Jean-Philippe Vassal won the Pritzker Prize this year, their victory was hailed as a turning point. They have earned a reputation for turning down commissions or proving to city councils why refurbishment would be better – and cheaper – than building something new.

They remain outliers though. For the most part, building greener still involves actual construction.

Make no mistake. Green projects such as L'Innesto becoming the norm would be a big step forward. But there is no getting around the fact that three decades to carbon neutrality is a long time in the fight against climate change.

This is the industry's inconvenient truth. The climate crisis is, in no small part, a product of our voracious appetite to build. It is not something, as climate activist Greta Thunberg has pointed out, that we can simply build our way out of. We cannot afford to only build greener. We need to build less. ■

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L'Innesto, Italy's first carbon-neutral social housing project

Keeping a zero-carbon footprint while living in a city can sometimes feel like a distant, lofty ambition. With its plans for a large-scale sustainable housing masterplan, Milan is embracing a bold regeneration strategy for its first carbon-neutral social housing development.

Working on the six-hectare, former rail depot of Scalo di Greco Breda, Arup together with Fondo Immobilare Lombardia (FIL) and architects Barreca & La Varra have developed a proposal for what will the country's first zero-carbon affordable housing development.

The vision, predicated on the delivery of an innovative, decentralised low-carbon district heating network, has won the C40's Reinventing Cities competition, a global contest that invites innovative carbon-free and resilient design solutions for the regeneration of underused urban space.

The design embeds circular economy principles from the strategic planning stage, and unlocks value for all the stakeholders: private sector investors, public sector actors such as the Milan municipality, the rail administration FS Sistemi Urbani, the university and above all, the local residents.

Arup is coordinating the project on behalf of FIL. As well as leading the masterplan design, our consultants and specialists are the Circular Economy advisors and are also providing sustainable and environmental design as well as the decarbonization strategy.

Project Summary

First zero carbon social housing in Italy

21,000 m² affordable housing

72 per cent green areas

Located next to the Greco Pirelli train station in the north east of the city, the six-hectare Scalo Greco Breda site is a former freight depot. The botanical roots of the aptly named L'Innesto translate into real life: the project will be a 'green' implant grafted onto this industrial rail area. The masterplan will connect the mixed-use historical neighbourhood of Precotto and the former industrial area of Biccoca, which currently provides housing and services to the nearby university campus.

As a sort of urban sustainability sandbox, the partnership between the public and private sectors is expected to be a replicable and scalable intervention to test carbon-neutral initiatives and inform future policy making.

Italy's first zero carbon social housing project

The winning proposal is based on the development of an innovative decentralized 4th Generation District Heating (4GDH) powered by renewable sources, including an urban wastewater heat-recovery system. To achieve a zero C02 emissions balance within 30 years, the buildings are designed to be near-zero energy and will be built with a pre-assembled construction technology, enabling the modular structures to be disassembled and recycled.

Soil excavation will be minimized and treated with bio-remediation techniques on site to be re-used for landscaping. Vegetable gardens, a garden nursery, green seeded roofs and 'edible' landscapes will create an agricultural heart.