What does sustainable building mean, and can we measure it?

Sustainable architecture is often regarded as a return to the foundational principles that guided construction before the mass industrialization of the late 18th century. In the era before modern industry catalyzed a widespread demand for housing, builders instinctively – or rather, by necessity – adhered to what we now classify as green principles—employing locally sourced materials and adopting natural insulation and ventilation techniques.

But in the 200 years since urbanization started to gain steam, the world's population has quadrupled, and more than half of the global citizens live in cities. In other words, merely reducing emissions from transport and tweaking fundamental building techniques was never going to be enough to flip the climate script on an industry perpetually tasked with meeting the needs of a growing and rapidly urbanizing world population. In the last few decades, the term "sustainable" has expanded to encompass a plethora of rules, norms, innovations and ever-mounting expectations for how to build without compromising the health of our planet. So, against that backdrop, what does sustainable architecture mean in 2024?

Foundational principles remain. Just like energy efficiency evolved as the leitmotif for greening the built environment as strategies like passive solar or thermal heating made their way into the mainstream, reducing energy consumption and reliance on fossil fuels are at the top of climate-aware architects' agendas. But rather than merely looking at the energy use of a certain building, the climate scope has widened to

include every aspect of the construction chain. Architects are now more mindful of the environmental impact of construction materials, considering factors such as embodied energy and end-of-life disposal. The use of recycled, upcycled, and even biobased materials has gained prominence, contributing to the reduction of waste and environmental degradation. The shift towards circular design represents a pivotal advancement in sustainable architecture.

Another aspect of this circular approach is water efficiency and conservation. Designers now incorporate rainwater harvesting, graywater systems, and efficient irrigation techniques to minimize water consumption. Additionally, green infrastructure elements like vertical gardens and permeable surfaces contribute to stormwater management and biodiversity, further enhancing the environmental performance of buildings. And to that already lengthy list can also be added the social factors of sustainable design, which emphasizes the creation of inclusive spaces that are accessible to all people, regardless of their abilities. It also means promoting social interaction, encouraging physical activity, and enhancing wellbeing.

Needless to say, climate-friendly construction has come a long way in the half-century sustainable design began to regain traction. But with increased scope also comes increased complexity, and it begs another question: How do we accurately measure sustainability today?

While calculating the energy expended in constructing a building and assessing the carbon footprint of materials might seem straightforward, construction projects involve a complex network of suppliers, contractors, subcontractors, and various stakeholders. In essence, much like the ever-evolving, intricate nature of the environment, the built environment is similarly multifaceted, posing challenges in benchmarking performance at each stage. To boot, there isn't one unified metric to measure the climate impact of architecture which means that standards differ between countries.

To learn more about sustainable architecture, its possibilities and challenges, as well as how we can better evaluate climate performance, our team ventured to Gothenburg to talk to Anna Graaf. A civil engineer by training, Anna has spent more than two decades at the head of White Arkitekter’s climate work, first as a consultant and later as the firm’s director of sustainability. In 2022, she was elected as a part of the Delegation for Circular Economy.

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