

## 3D Printing Takes a Green Turn: Carbon-Capturing Concrete

By: [Nidhi Goyal](#) | December 24th, 2024

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### A Revolutionary Innovation in Construction

In a groundbreaking development, researchers at Nanyang Technological University, Singapore, have introduced a revolutionary 3D concrete printing technique that not only reduces the carbon footprint of construction but also enhances the strength of the resulting structures.

### How It Works: Infusing CO<sub>2</sub> into Concrete

This innovative method involves injecting steam and captured carbon dioxide (CO<sub>2</sub>) into the concrete mix during the 3D printing process. The CO<sub>2</sub> reacts chemically with the mix, solidifying the concrete while trapping the CO<sub>2</sub> within its structure. The outcome is a stronger, more durable concrete that also functions as a carbon sink. This technique reduces carbon emissions, boosts compressive strength by 45%, and supports sustainable construction practices.

### A Greener Future for the Construction Industry

This advancement in 3D printing has the potential to transform the construction industry, paving the way for greener, stronger, and more resilient buildings.

### Expert Insights on the Technology

Professor Tan Ming Jen, the lead researcher from NTU's School of Mechanical and Aerospace Engineering (MAE) and the Singapore Centre for 3D Printing (SC3DP), emphasized the technology's far-reaching impact.

"The building and construction sector contributes significantly to global greenhouse gas emissions," he explained. "Our newly developed 3D concrete printing system offers a carbon-reducing alternative by not only improving the mechanical properties of concrete but also helping to mitigate the sector's environmental impact. It showcases the potential to use CO<sub>2</sub> produced by power plants or other industries for 3D concrete printing."

#### **Nidhi Goyal**

Nidhi is a gold medalist Post Graduate in Atmospheric and Oceanic Sciences.