

Sustainability in the construction industry:

Projects that have taken innovation to the next level

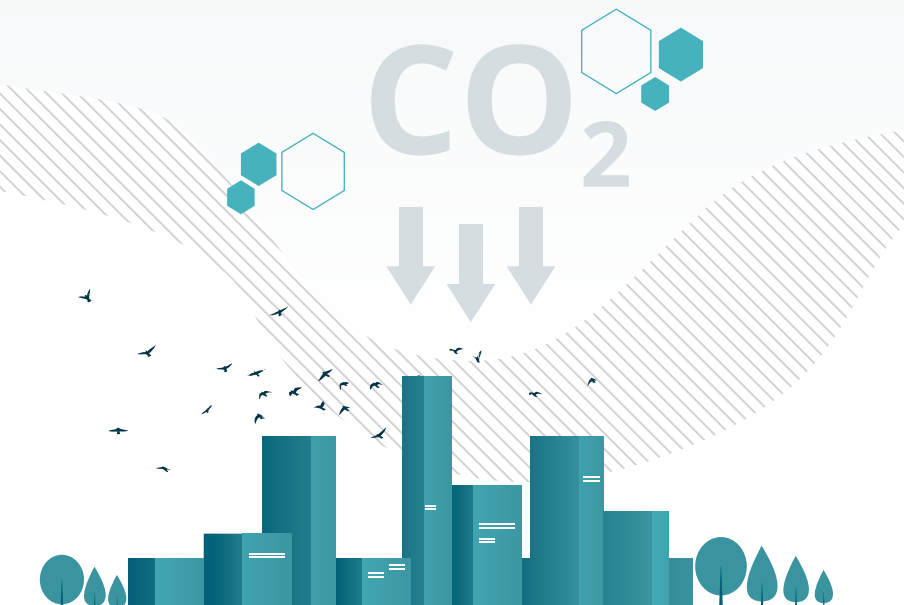


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Emissions and waste from the construction industry are raising red flags across the world. A UN Environment Program (UNEP) report called "[2021 Global Status Report for Building and Construction](#)" found that energy-related emissions from buildings and construction represented 37 percent of the global total in 2020. Further, [research](#) shows that between 10 and 15 percent of total building material is lost as waste. This waste includes toxic material like lead and asbestos that is difficult to dispose. Add upstream emissions from transporting construction material and downstream waste from demolition—and it's clear that the construction industry has to take urgent action to reduce its Greenhouse Gas (GHG) emissions and adopt sustainable practices.

The goals set for the industry are steep. The [UNEP estimates](#) that direct GHG emissions need to fall 50 percent by 2030 so the industry can meet its goals for net-zero carbon building stock by 2050. By 2030, 68 percent of the [global population will live in urban areas](#) (up from 55 percent today), adding to the growth in construction needs. The clock is ticking, and if the industry does not respond, it will be among the major contributors of global warming, vanishing glaciers, rising sea levels, unpredictable weather patterns, wildfires, and the acidification of the oceans.



Read the memo:

Sustainability practices are no longer a choice

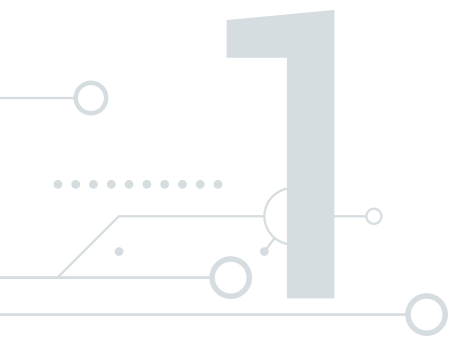
In the U.S., residential and commercial buildings generate 29 percent of U.S. GHG emissions. A United States Environmental Protection Agency report showed that 600 million tons of construction and demolition debris were generated in the U.S. in 2018, twice the amount of municipal solid waste. Ergo: expect public sector infrastructure and capital planning projects to come under intense scrutiny. Organizations that advocate, institute, invest in, and execute sustainable practices will find themselves more easily on the government shortlist for large public sector projects. Investors too will gravitate toward organizations committed to demonstrating ambitious Environment, Social, and Governance (ESG) targets.

Sustainable practices are no longer a choice. They are a business necessity. A commitment to ESG will attract business, drive growth, and reduce costs while minimizing regulatory penalties. The rise in sustainable practices can be seen in diverse pockets across the world. These provide cues for the broad adoption of sustainability practices on capital projects.



Sustainable practices for capital projects





Sustainable materials

Bendable concrete that contains fibers from polymers to improve flexibility, precast concrete with its low dependence on energy, replacing carbon-heavy steel and concrete with mass or laminated timber, using salvaged or recycled materials, and intelligent use of 3D printed concrete to eliminate frameworks are ways to lower the carbon footprint.



In Bali, the Tiing Hotel, designed by Australian architect Nic Brunsdon in collaboration with local firm Manguning, uses bamboo and concrete for its walls.



2

Climate-responsive design

Decreasing energy consumption using a climate-responsive design for heating and illumination is a way to slash emissions over the entire lifecycle of a site.



The Oslo airport has slashed energy bills by 50 percent, compared to the existing terminal, using smart designs that took advantage of on-site energy.



3

Durability of construction

Long-term design can lower the economic and environmental costs of capital projects like bridges and roads if they are built to last for centuries rather than decades.



The Bellefontaine pavement in Ohio, built in 1893, is still in use. Its longevity has resulted in a reduction of waste from demolitions.



4

Recycling materials

Recycling or salvaging non-hazardous construction and demolition debris can keep much of it out of landfills. Residential properties and hotels made from recycled and reused material exist around the world. With the scale of material involved in capital construction, recovering usable components can help reduce waste and costs.



The SOS Children's Villages
Lavezzorio Community Center
in Chicago upcycled aggregated
waste to create the façade of
their building.



5

Retrofitting for upgrades

Retrofitting buildings with new technology goes a long way in stemming energy and water waste.



The **Almeric L. Christian Federal Building** on Saint Croix has achieved net-zero energy use, which resulted in savings exceeding \$500,000 per year.



6

Redesigning for space optimization

Optimizing space using a shared model can reduce the demands for space. This is an important consideration as growth in urbanization puts more pressure on real estate.



The Ecobulevar in Madrid, Spain, allows its structure to be exported and re-installed in other locations.



Aiming for higher efficiency

Research at Aarhus University found that lean construction driven by efficient construction management can promote the elimination of waste; just 36 more seconds per hour spent on generating value could equal \$5.4 billion per year for the construction industry's GDP in the U.S. and Canada.



The **Bullitt Center** in Seattle uses non-toxic building materials, rainwater harvesting, and geothermal wells to become net positive for energy.



Just-in-time inventory

The strategy of ordering materials only when needed is central to lowering waste and cost in large capital projects. Technology can analyze data from numerous sources to make accurate forecasts for material needs.



A good construction management system allows you to forecast fund utilization, manage material usage, and enable capacity planning.



About Aurigo Software

Aurigo builds software that helps build the world. Aurigo is an AI-native company that helps capital owners connect planning, construction, and operations in a single environment, improving decision-making and execution. Trusted by over 300 organizations across infrastructure and facilities, Aurigo manages more than \$450 billion in capital programs, with over 40,000 projects throughout North America. Aurigo is a privately held U.S. corporation headquartered in Austin, Texas, with global offices in Canada, South Africa, and India.

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