UN environment programme

Global Alliance for Buildings and Construction

TRANSFORMING THE BUILT ENVIRONMENT THROUGH SUSTAINABLE MATERIALS

Buildings are responsible for 35 per cent of global energy-related carbon dioxide emissions and 32 per cent of global energy demand. Until now, most of the progress in the sector has been made on reducing the "operational carbon" of a building – the emissions created from heating, cooling and lighting. However, solutions for reducing the "embodied" carbon emissions arising from construction, maintenance and demolishing of buildings have lagged far behind.

The United Nations Environment Programme (UNEP) and its partners are supporting countries to accelerate a transition towards circular, low-carbon, and resource-efficient built environment. Through the creation of enabling frameworks for sustainable materials, the project fosters responsible acquisition and use of building materials, stimulates local market development, and supports countries in raising their climate ambition within the buildings and construction sector.

Implemented in collaboration with:

UNOPS

UN-HABITAT

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THE CHALLENGE

The global building sector stands at a crossroads. As urban populations continue to grow, the demand for new construction materials is soaring—placing immense pressure on natural resources and driving up greenhouse gas emissions.

With global building floor area projected to more than double by 2050, annual embodied emissions—those associated with the extraction, manufacture, and transport of building materials—will rise sharply unless the carbon intensity of construction is significantly reduced. Under a business-as-usual scenario, cumulative embodied emissions from new construction could reach 75 gigatonnes of CO2 between now and 2050 .

As heating systems become electrified and power grids decarbonize, embodied emissions are expected to represent an ever-larger share of total building-related emissions. Alongside efforts to cut operational emissions, targeted action to reduce embodied carbon is essential to align the sector with global climate goals.

THE SOLUTION

- Institutionalize stakeholder coordination and develop national and sub-national roadmaps and action plans for the decarbonization of the built environment
- Link public procurement with decarbonization practices
- Make carbon visible through improved data access and quality
- Adapt norms and standards to allow for the use of alternative or lower-carbon building materials and construction practices
- Promote the adoption of sustainable management and production of bio-based materials

BUILDINGS ARE RESPONSIBLE FOR 35% OF GLOBAL ENERGY-RELATED CARBON DIOXIDE EMISSIONS AND 32% OF GLOBAL ENERGY DEMAND[2].

NEARLY HALF OF THE BUILDINGS THAT WILL EXIST BY 2050 ARE YET TO BE CONSTRUCTED, THIS SECTOR PRESENTS BOTH AN URGENT CHALLENGE AND UNPRECEDENTED OPPORTUNITY FOR CLIMATE ACTION.

EMBODIED CARBON FROM MATERIALS LIKE STEEL AND CEMENT PERSISTS AS A MAJOR SOURCE OF EMISSIONS, CONTRIBUTING TO 18 PER CENT OF GLOBAL BUILDING-RELATED CARBON DIOXIDE EMISSIONS.

SUSTAINABLE MATERIALS ARE KEY TO ACHIEVING SDG 11,12 &13 AND THE PARIS AGREEMENT

THE PROGRAMME PROVIDES SUPPORT ACROSS THREE MAIN ACTIVITY AREAS

The project builds capacity, policies, and markets that enable countries to use sustainable materials at scale—supporting circularity, climate action, and economic opportunity.

1. **Strengthen policy and regulatory frameworks**

   Integrate resource efficiency and environmental performance requirements for building and construction materials into procurement policies, building codes, and national climate strategies. Support the development of incentives and planning instruments to accelerate market uptake of sustainable materials.

2. **Demonstrate innovation and build capacity**

   Showcase the techno-economic viability of low-carbon, resource-efficient materials and circular construction practices through pilot projects. Strengthen the capacity of government institutions, private sector actors, and local practitioners to lead and sustain this market transformation.

3. **Generate and share knowledge**

   Produce and disseminate data, lessons, and best practices on mainstreaming low-carbon, resource-efficient materials and on developing sustainable materials markets for the building and construction sector.

[1]*Building Materials and the Climate (UNEP 2023)*

[2]*Global Status Report for Buildings and Construction (UNEP*

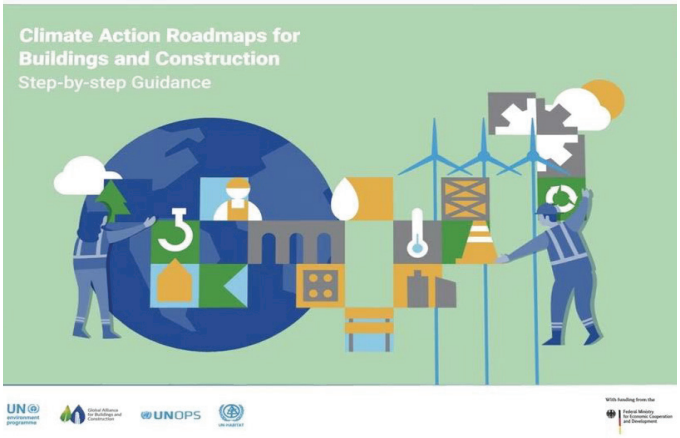
PROJECT HIGHLIGHTS

PAVING THE WAY FOR A LOW-CARBON ,CLIMATE RESILIENT BUILT ENVIRONMENT WITH THE CLIMATE ACTION ROADMAP FOR BUILDINGS AND CONSTRUCTION TOOLKIT

Launched at COP29, the Climate Action Roadmap for Buildings and Construction Toolkit is a step-by-step guide that helps countries set clear goals, identify priority actions, and chart a pathway toward a low-carbon, resource-efficient, resilient, and inclusive buildings and construction sector. The toolkit provides practical tools, templates, and video resources to support every stage of roadmap development.

This new roadmap framework promotes a holistic approach to decarbonization—addressing the entire building value chain, from material manufacturing and construction to use, renovation, and end-of-life. It also places climate adaptation and social inclusion at the core of national decarbonization strategies.

Bangladesh, Ghana, Senegal, and the State of Odisha (India) have already applied this methodology to develop their Climate Action Roadmaps for Buildings and Construction. These roadmaps are now guiding national climate policies and informing the enhancement of Nationally Determined Contributions (NDCs) in the buildings and construction sector.



ENABLING FRAMEWORKS

- Green Building Standards and Technical Guidelines developed in Bangladesh, Ghana, and Senegal to promote sustainable construction practices and improve the environmental performance of buildings.
- Lifecycle Assessment (LCA) methodology and framework established in India to measure and account for embodied carbon emissions in residential buildings.
- National Assessments on Material Efficiency Strategies conducted in Bangladesh and Ghana, identifying opportunities to reduce resource use and promote circularity in the buildings and construction sector.
- Policy recommendations formulated to integrate low-carbon and resource-efficient materials into public procurement frameworks, encouraging market demand for sustainable products.

DEMONSTRATION PROJECTS

Maharastra (India):

Techno-economic feasibility for the use of low-carbon construction materials in the redevelopment of a residential housing in city of Thane, paving the way for more sustainable urban regeneration.

Odisha (India):

Demonstrating the potential of green and inclusive housing by redeveloping 44 homes in the Pragati Vihar transgender community using low-carbon materials, passive cooling, and circular, climate-resilient design—showcasing how sustainability and social inclusion can go hand in hand in India's housing sector.

Ghana

Working with the Ministry of Works and Housing to develop models for low-carbon, resource-efficient, and climate-resilient social housing in rural districts—demonstrating how sustainable construction can enhance both community resilience and quality of life

Senegal

Developing a pilot facility to produce Typha-based insulation boards in partnership with the Ecole Supérieure Polytechnique de Sénégal—transforming a locally abundant plant into a low-carbon, high-performance building material. Typha, which grows naturally in rivers, provides an eco-friendly alternative to conventional, fossil fuel–derived insulation products

Bangladesh

Partnering with the Dhaka Urban Development Authority to incorporate low-carbon and sustainable materials in the development of a public space project, showcasing greener approaches to urban design.

DIGITAL TOOLS

- The CAPSA Digital Building Passport has been upgraded with a new module to track embodied carbon and show the carbon savings achievable by using sustainable materials. The module was piloted in India and Ghana, helping stakeholders make smarter, greener construction choices.

CAPACITY BUILDING

- In partnership with local organizations, the project delivers hands-on training on eco-innovation, circular building practices, bio-climatic design, low-carbon materials, and building regulation enforcement—empowering SMEs, architects, and regulators to build greener, more resilient communities

KNOWLEDGE SHARING AND AWARENESS RAISING AT NATIONAL, REGIONAL AND INTERNATIONAL LEVEL

The project drives global and regional knowledge exchange on sustainable building materials:

- Through the GlobalABC Materials Hub,a global information hub on Building and construction materials that brings together more than 200 resources to support governments and policymakers to pivot towards the use of more sustainable, less carbon-intensive materials. ,
- By supporting the organization or regional forums (eg. "Regional Forum on Innovative Materials and Sustainable Construction in West Africa", and creating national collaboration platforms such as the Mainstreaming Alliance on Green and Resilient Buildings in India
- And by raising awareness at high-profile international events, including COP, WUF, and the Buildings and Climate Global Forum, and the Annual Assembly of the Global Alliance for Buildings and Construction Annual Assembly.

JOIN US IN SHAPING A LOW-CARBON, RESILIENT FUTURE FOR BUILDINGS AND CONSTRUCTION

Learn more: Homepage| GlobalABC, Sustainable buildings | UNEP - UN Environment Programme

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