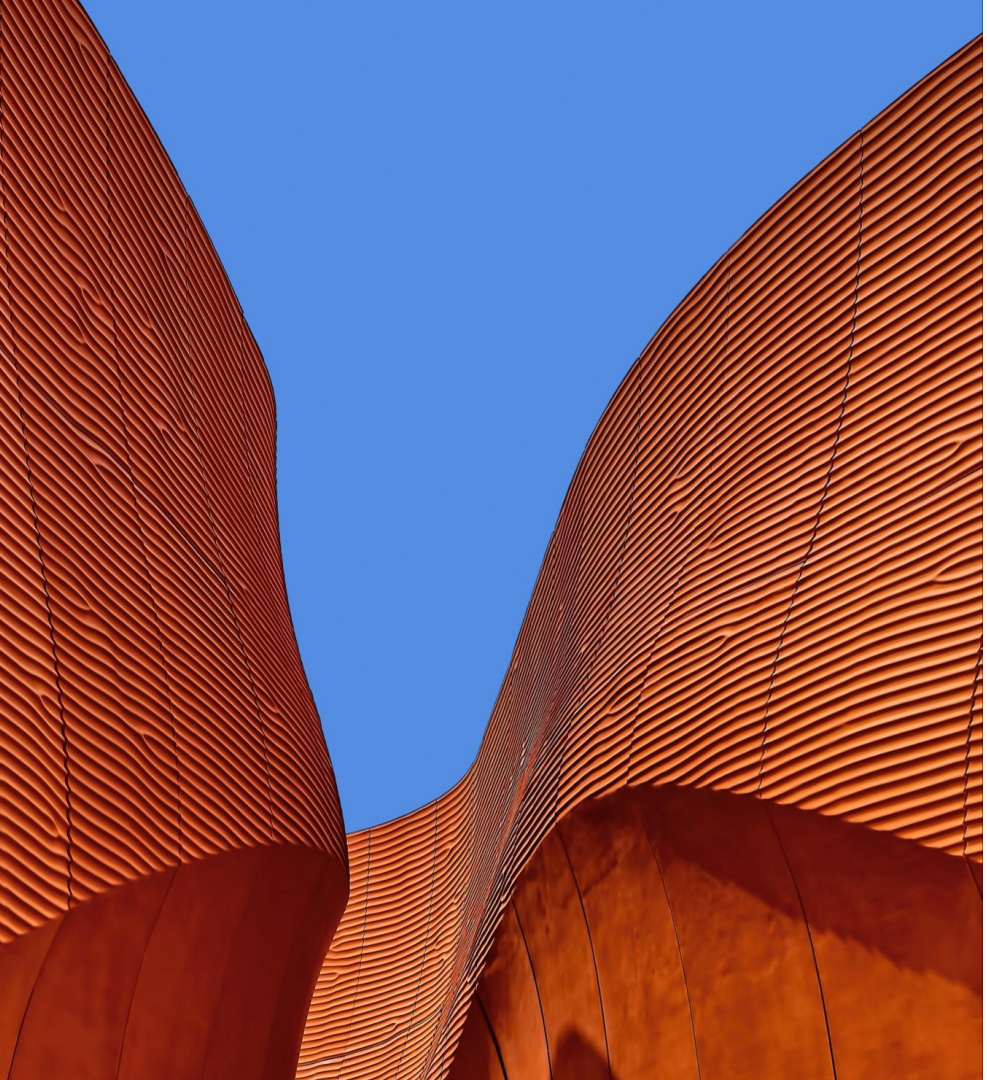

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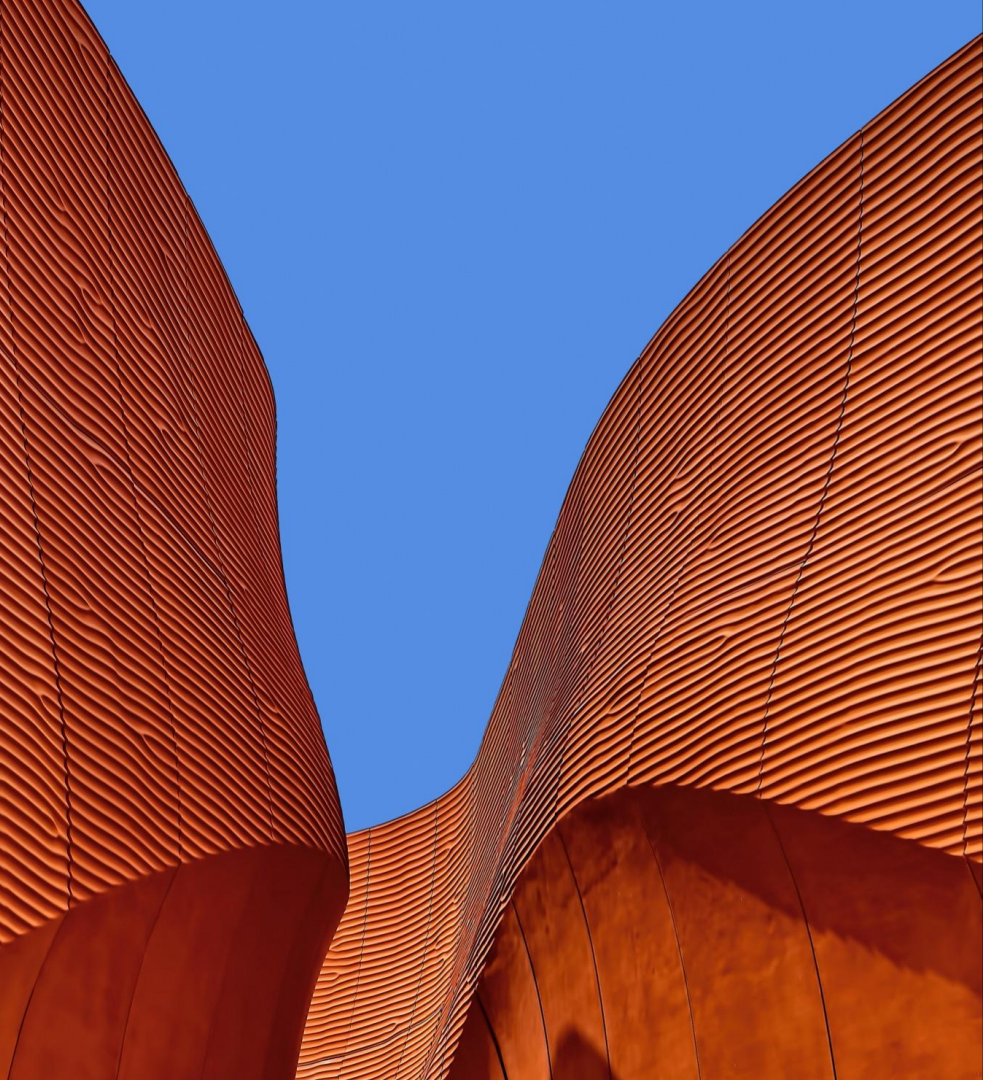
Sustainable Building Materials Hub

Launch event: World Green Building Week 2023

GlobalABC/UNEP & Bioregional – 13 September 2023

Agenda

Time (BST)	Topic	Presenters
14:00-14:05	**Welcome - Why Building Materials?**	Sue Riddlestone OBE
14:05-14:15	**Introduction to the hub – context, purpose & objectives**	Mona Mohammed
14:15-14:30	**Hub walkthrough, functionality, and user experience**	Stewart Muir
14:30-14:40	**End-user perspective**	Nicolás Ramírez
14:40-15:00	**Q&A**	Sue Riddlestone OBE, all



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Welcome - Why Building Materials?

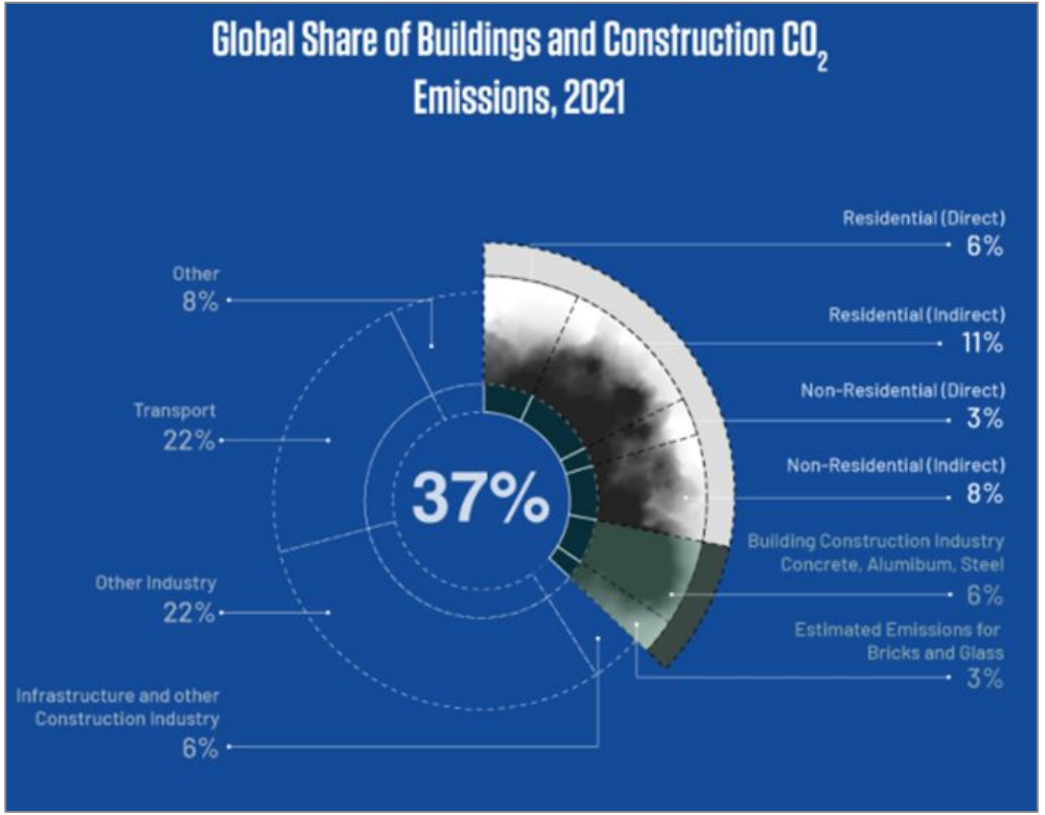
Sue Riddlestone OBE, CEO & Co-founder, Bioregional

GlobalABC/UNEP & Bioregional – 13 September 2023

Welcome

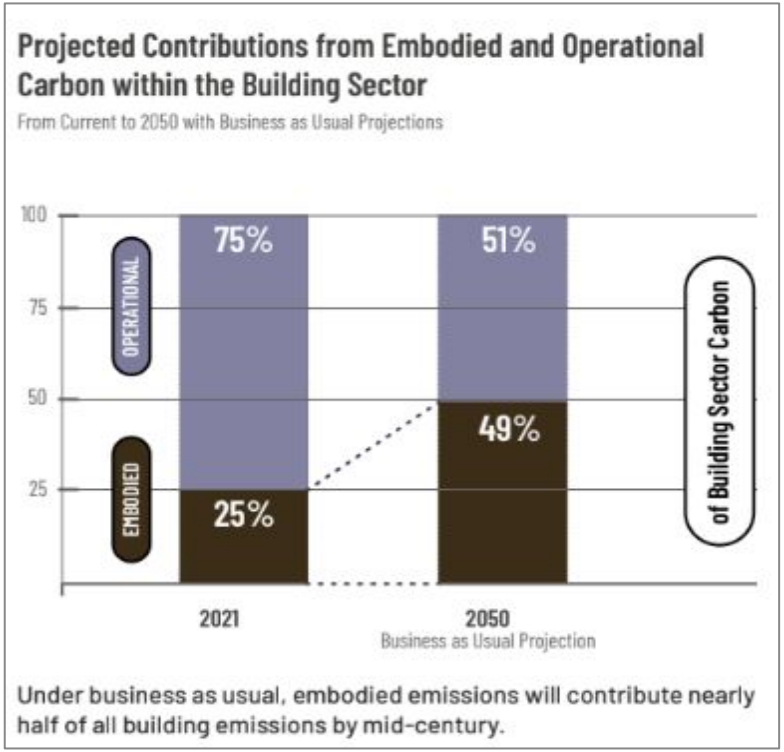
Why building materials?

- The buildings and construction sector is already the **largest contributor** to global carbon emissions at 37% (operational and embodied).
- Construction materials represent an estimated 9% of overall energy-related CO2 emissions.
- Construction materials are set to b resource consumption in fast-growing developing economies, with associated greenhouse gas emissions expected to **double by 2060.**
- In G7 countries, **material efficiency strategies** could reduce greenhouse gas emissions in the material cycle of residential buildings by 80–100% in 2050.



We are tackling operational carbon - we are not addressing embodied emissions of materials fast enough

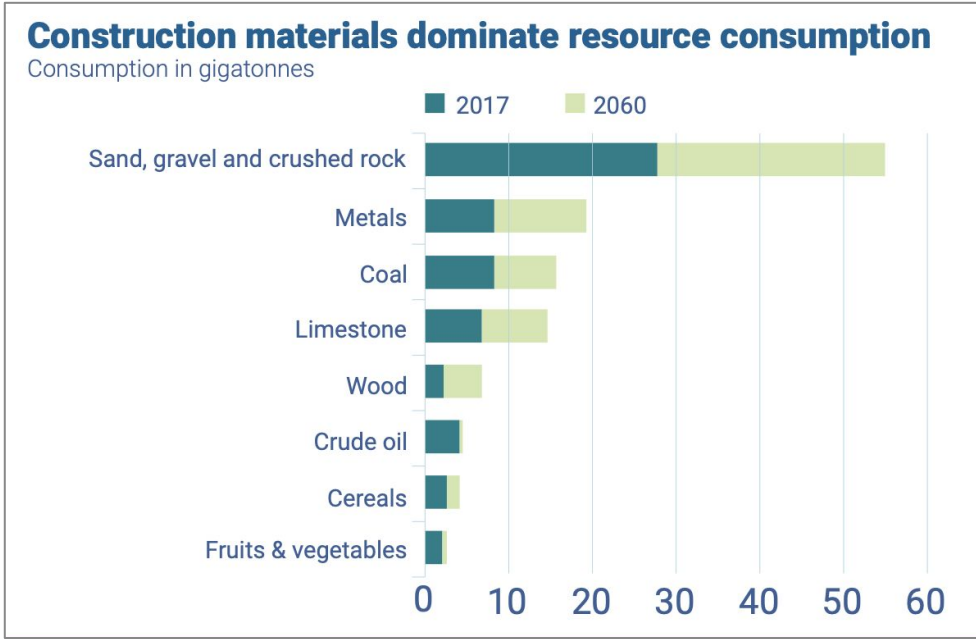
- Embodied carbon of building materials is significant and the impact of this is projected to vastly increase
- The **choice of construction materials** affects every aspect of a building's carbon footprint.
- A variety of strategies are needed to address this issue and business as usual is not an option in terms of the materials we use, and how we use them in construction.



Source: Building Materials and the Climate: Constructing a new future

Reducing the impacts of resource consumption and improving circularity is vital

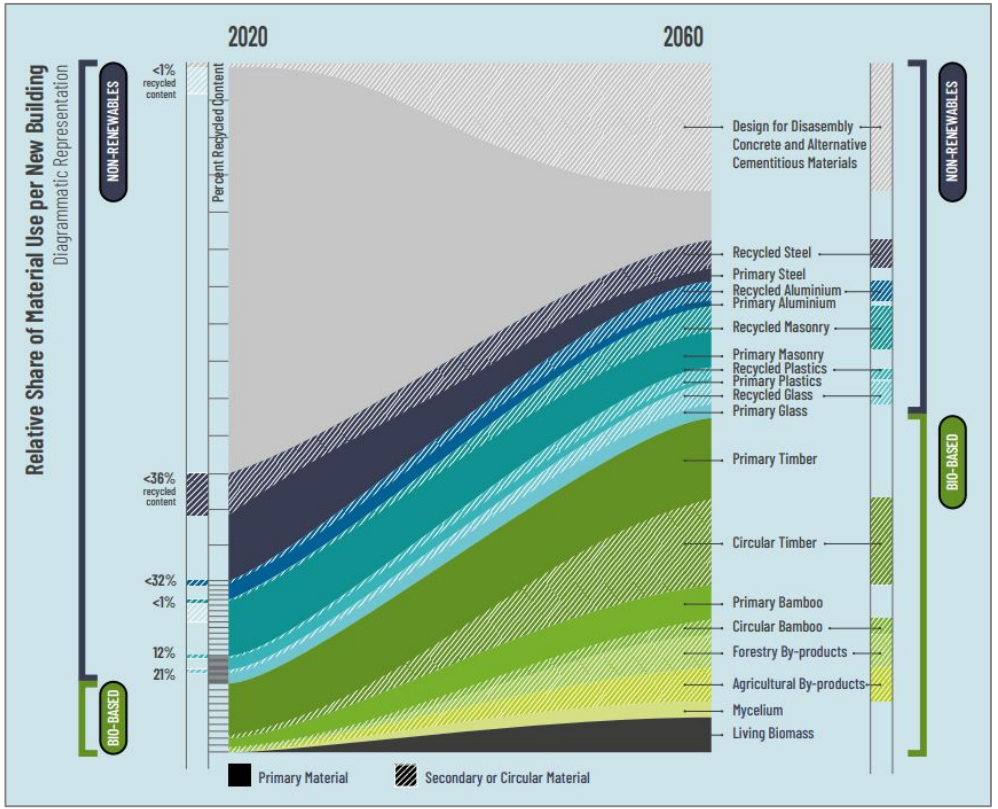
- Ca. **100 billion tonnes** of waste is caused by construction, renovation and demolition, with about **35%** sent to landfills.
- Recent UNEP press release reports on the impacts of **sand extraction**; 6 billion tons extracted annually, affecting biodiversity and coastal communities



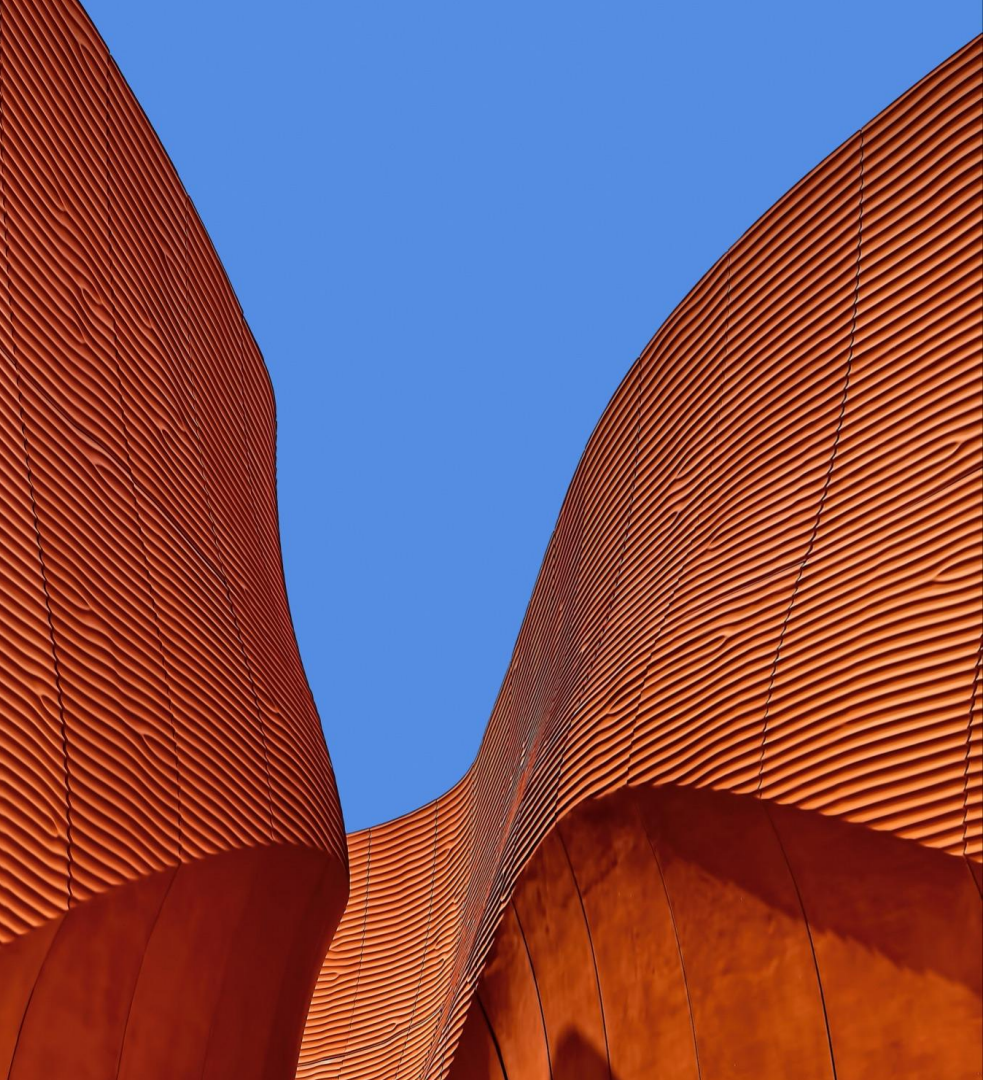
Source: OECD 2019. Adapted from 'Global Material Resources Outlook to 2060: Economic Drivers and Evironmental Consequences' (OECD 2019).

The challenge for policymakers

- 50% of the buildings that will stand in 2060 **have not yet been built** – how do we deliver this next wave of construction sustainably?
- How do we improve circularity and decarbonise key materials at the same time as a massive rise in demand?
- How can we make bio-based and low-carbon materials the norm?



Source: Building Materials and the Climate: Constructing a new future



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Introduction to the hub – context, purpose & objectives

Mona Mohammed, Programme Officer, Life Cycle Initiative, UNEP

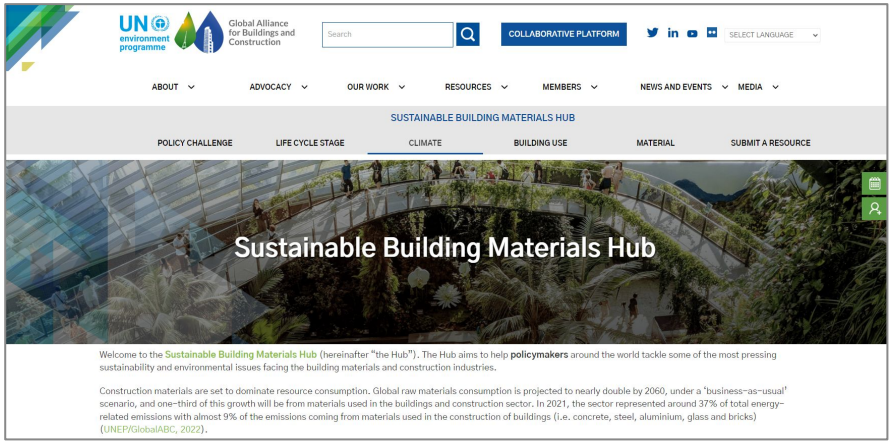
GlobalABC/UNEP & Bioregional – 13 September 2023

Introduction to the hub:

Context, purpose & objectives

Context of the Sustainable Materials Hub

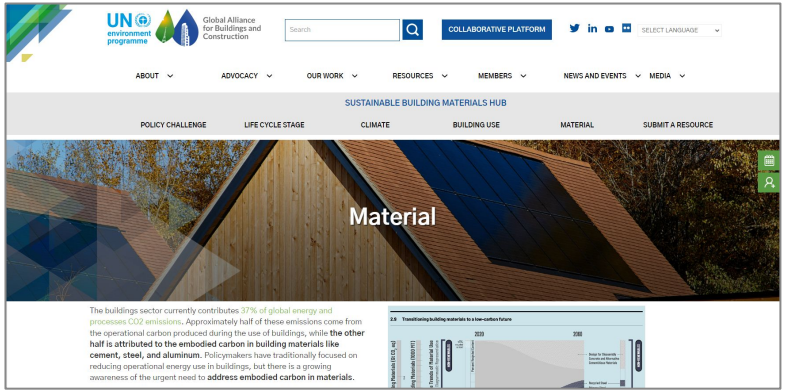
- The hub has been established in the context of the **'Transforming the Built Environment through Sustainable Materials'** project implemented by UNEP and funded by Germany's Ministry of Development Cooperation (BMZ).
- The hub is hosted on the GlobalABC website.
- It provides guidance in line with the GlobalABC mission and vision:
  - Raising ambitions to meet the Paris Agreement goals
  - Alignment with the UN's Sustainable Development Goals, the New Urban Agenda, and the Buildings Breakthrough target.
  - Mobilizing all actors along the value chain

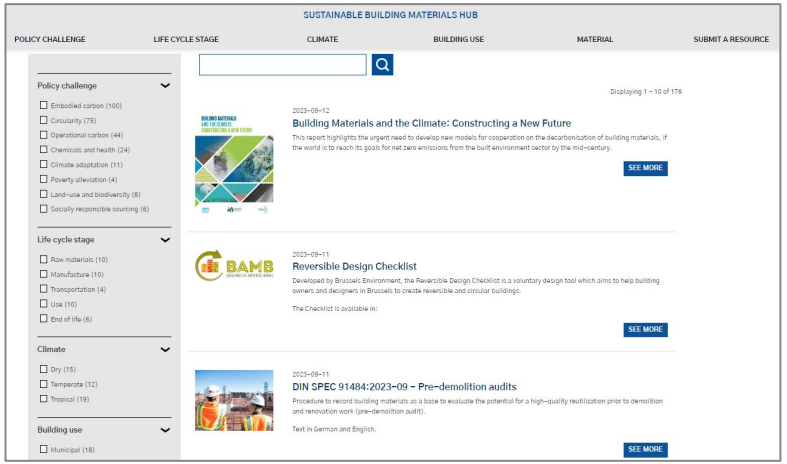


https://globalabc.org/sustainable-materials-hub/home

Context of the Sustainable Materials Hub

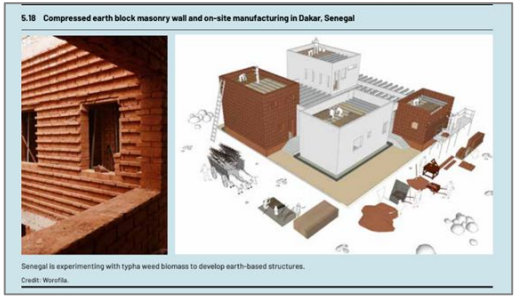
- The primary target audience is **policymakers.**
- The Hub also aims to connect governments, private sector, civil society, research & academia, intergovernmental and international organisations
- The Hub provides a range of resources, with global application, as well as considering different regional contexts
- The Hub draws on and organises the range of existing resources available, without “re-inventing the wheel”
- The Hub’s main pages provide background to the key near- and long-term goals, and frames the approaches and policies needed to decarbonise the buildings and construction sector and improve circularity





GlobalABC, UNEP and Yale CEA report - *Building Materials and the Climate: Constructing a New Future*

- This new report provides a comprehensive state-of-play profile for the climate and resource consumption impacts of buildings and construction, and informs the key messaging on the Hub.
- It sets out a roadmap of decarbonisation profiles for common building materials, and the transition to new materials.
- The report includes profiles of technological advances and new business models for the buildings and construction sector.
- It introduces emerging tools for data analysis and decision making.



Objectives of the Sustainable Materials Hub

- The hub promotes a **(whole) life cycle approach** to guide material efficiency strategies to address embodied carbon
- This can be clustered into 3 categories, aligned with the study : the **“Avoid”** strategy, the **“Shift”** strategy and the **“Improve”** Strategy.

Example “Avoid” strategy - deconstruction instead of unnecessary demolition

AVOID + **SHIFT** + **IMPROVE**

DESIGN BETTER BUILD WITH LESS

- Life-cycle analysis
- Resource-efficiency
- Circular approaches
- Durability and recycling
- Local value chains

USE ALTERNATIVE BUILDING MATERIALS

- Develop supply chains
- Standardize and certify products
- Mainstream alternative materials in conventional construction

DECARBONISE CONVENTIONAL MATERIALS

- Energy - efficiency
- Reduce Carbonised energy
- Process innovation
- Substitute with materials and natural fibers

Hub Consultation process

- Initial work to develop the concept took place in late 2021 with a global stakeholder group
- Work began in June 2022 to scope and build the first iteration of the Hub, with inputs from the **Sustainable Materials working group**
- Working Group is comprised of members from GBCs, associations, NGOs, industry, universities, architects, tool developers, material certification programmes

Discussions on:

- **Audience profile** – how best to reach policymakers, and those supporting policy
- **User journeys** - ease of navigation, functionality
- **Information management** – taxonomies and resource categorisation
- **Content** – entry point for users, and most useful resources to encourage action
- **Governance**, impartiality, quality control
- **Maintenance** - update frequency and keeping content engaging

Hub development timeline

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June – August 2022
Scoping and planning

September – December 2022
Website build
Content curation

December 2022
BETA version completed
Working group review

January – April 2023
Updates and content uploads

July-August 2023
Addition of content from
the Yale study

September 2023
Launch of the Sustainable
Materials Hub

Next steps for the Hub

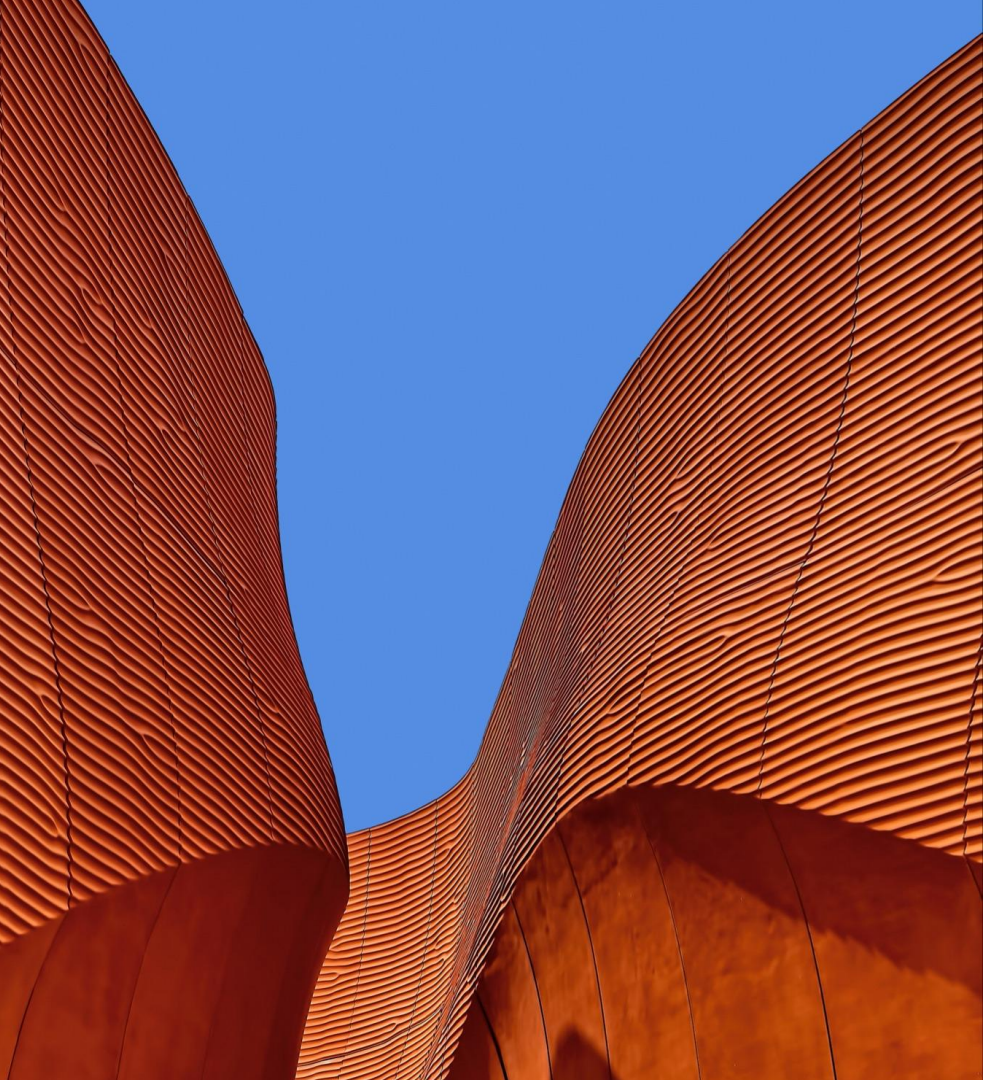
- The **Sustainable Materials Working Group** will continue to develop the Hub and upload resources, ensuring resources are independent, up to date and in line with science-based approaches to decarbonisation.

- Regular reviews will take place to ensure the Hub is providing the most useful resources, as needed in different countries.

- The Hub will continue to support knowledge sharing, capacity building and the practical work of the BMZ project **'Transforming the Built Environment through Sustainable Materials'** - supporting pilot projects in West Africa, India and Bangladesh.

- The Hub aims to support more ambitious policies for buildings in countries' NDCs.

- If you would like to be part of the Sustainable Materials working group, or have feedback/questions about the Hub, please contact the GlobalABC.



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Hub walkthrough, functionality, and user experience

Stewart Muir, Senior Technical Consultant, Bioregional

GlobalABC/UNEP & Bioregional – 13 September 2023

Hub walkthrough, functionality, and user experience

Policy challenge

Organising resources related to:

- Embodied carbon
- Circularity
- Operational carbon
- Chemicals and health
- Climate adaptation
- Poverty alleviation
- Land-use and biodiversity
- Socially responsible sourcing

Life cycle stage

- Promoting a life cycle approach in planning and material design
- Organising resources related to a specific life cycle stage where appropriate

Climate

- Categorising resources for different climatic conditions to ensure appropriate application
- Region-specific case studies, research and policies

Core sections of the Hub

Building Use

- Resources specific to different building designs, and use cases
- Connected to SPP, and means of funding
- One billion people estimated to live in informal settlements, a key inclusion

Material

- Expected to be a common first search term
- Improve strategies featured for common materials: concrete, cement, steel, aluminium
- Resources related to bio-based and earth construction materials included to drive forward shift strategies

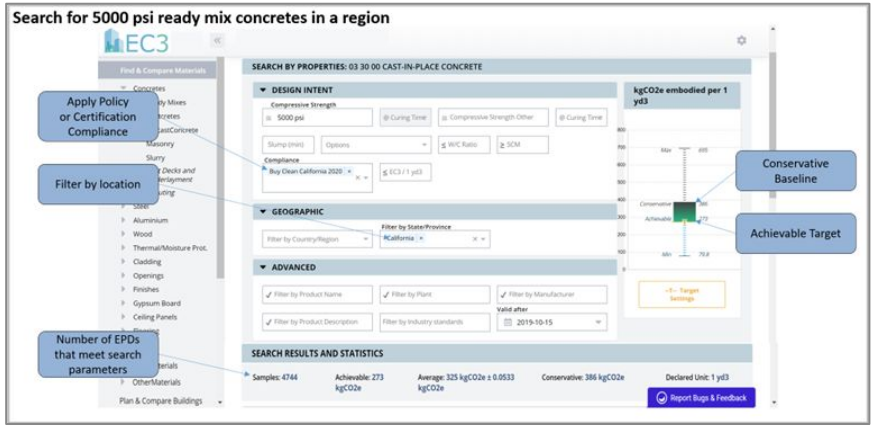
Resource types

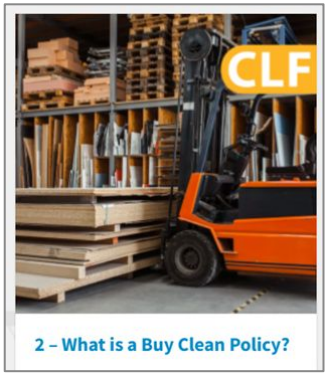
Tools

- Simple and more complex carbon calculators and LCA tools

Policy reports, briefs and toolkits

- Examples of effective policies such as embodied carbon limits, zoning, public procurement, deconstruction
- Roadmaps for material decarbonisation
- Toolkits, templates and educational resources





Clockwise from top:
EC3 tool from Building Transparency, Carbon Leadership Forum Policy Toolkit, C40 Cities/CNCA/One Click LCA policy paper

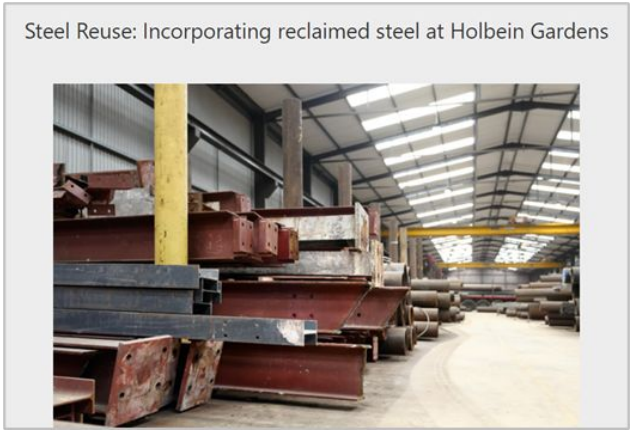
Resource types

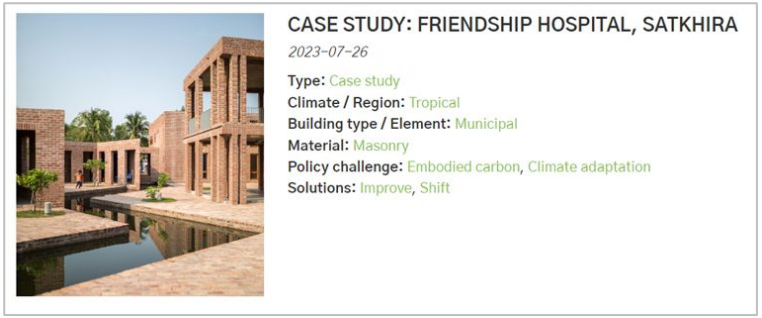
Case studies

- Inspiration and learnings from projects using more sustainable and local materials, re-use, deconstruction, and climate appropriate designs

Research papers

- LCA studies, performance testing, field studies
- Sustainable design principles
- Status and emerging trend studies
- Social studies – e.g. perceptions of earth and bio-based materials





Case study of re-use of a steel frame structure from the UK (top); case study of an award winning, climate-focused design using earth-based materials from Bangladesh (bottom)

The Hub's user journey

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Applied Filters

Embodied carbon ⊗

Clear all filters ⊗

Policy challenge ^

- [x] Embodied carbon (99)
- [ ] Circularity (72)
- [ ] Operational carbon (44)
- [ ] Chemicals and health (24)
- [ ] Climate adaptation (11)
- [ ] Poverty alleviation (4)
- [ ] Land-use and biodiversity (8)
- [ ] Socially responsible sourcing (6)

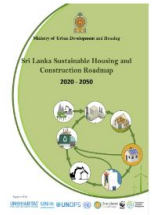
Applied Filters

Embodied carbon ⊗ Policy brief ⊗

Clear all filters ⊗

Resource type ^

- [ ] Tool (15)
- [ ] Database (6)
- [ ] Case study (6)
- [ ] Research paper (31)
- [x] Policy brief (15)
- [ ] Educational (12)
- [ ] Forum (1)
- [ ] News (0)
- [ ] Webinar (0)
- [ ] Report (26)
- [ ] Standard (4)
- [ ] Training (3)



2022-12-09

Sri Lanka Sustainable Housing and Construction Roadmap 2020 – 2050

This report – Sri Lanka Roadmap for Sustainable Housing and Construction 2020 – 2050 – presents the findings of the Sustainable Building Construction Country Assessment for Sri Lanka (SBC-CA) and a Roadmap for Sustainable Housing and Construction and achieving NDCs in the construction industry in Sri Lanka. It examines the current status, and potential opportunities and challenges for adopting Sustainable Building Construction (SBC) practices and policies.

SEE MORE

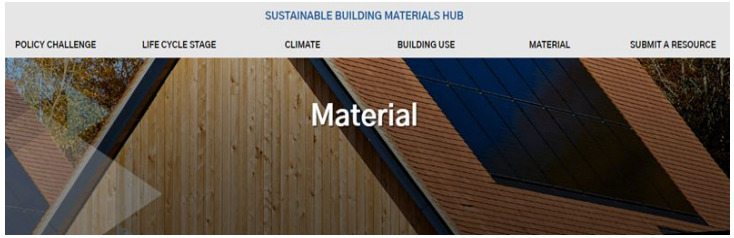
2022-12-09

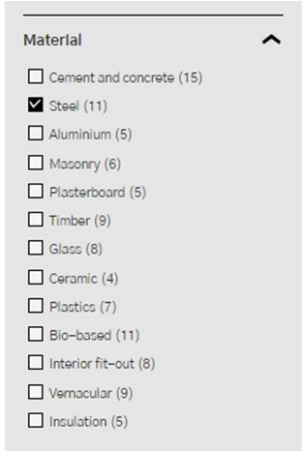
Reducing Carbon Emissions over the Life of a Building: Opportunities in the 2022 EPBD Recast

The current Commission proposal does not go far enough in addressing operational and embodied carbon emissions on building lifecycle global warming potential (lifecycle-GWP), often referred to as Whole Life Carbon (WLC). Deploying WLC measures in the EU Energy Performance of Buildings Directive (EPBD) recast will be a win-win for energy performance and climate action at the building and industry level. Therefore, a stepwise approach and a clear timeline that go beyond 2030 needs to be set out in the EPBD recast.

SEE MORE

The Hub's user journey





DISRUPT

2023-07-12

Delivering Innovative Steel ReUse Toolkit

Thanks to funding from Innovate UK, in collaboration with the NICER programme, a new 'toolkit' has been developed as part of the ASBP-led 'Delivering Innovative Steel ReUse ProjecT' (DISRUPT).

SEE MORE

Global Energy Monitor

2022-12-12

Global Steel Plant Tracker

From the Global Energy Monitor, The Global Steel Plant Tracker (GSPT) provides information on global crude iron and steel production plants, and includes every plant currently operating with a capacity of five hundred thousand tonnes per year (ttpa) or more of crude iron or steel. The GSPT also includes all plants meeting the five hundred ttpa threshold that have been proposed since 2017 or retired or mothballed since 2020.

SEE MORE

2022-12-07

Evaluating re-use potential: Material profiles and vision for project workflow

With the built environment responsible for almost 40% of energy-related carbon emissions globally, we must find new ways to design and construct our cities.

Reuse of materials is a key principle within a circular economy, ensuring material value is maintained for as long as possible. Use of reclaimed materials in construction has the potential to reduce the embodied carbon of construction, minimising the need for virgin material extraction and production as well as reducing volumes of waste generated and other negative externalities.

SEE MORE

The Hub's user journey

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Applied Filters

Municipal ⊗ Embodied carbon ⊗

Clear all filters ⊗

Building use

- [x] Municipal (21)
- [ ] Commercial (19)
- [ ] Infrastructure (20)
- [ ] Residential (20)
- [ ] Social housing (16)
- [ ] Informal settlements (11)

Climate

Life cycle stage

Material

Policy challenge

- [x] Embodied carbon (21)

2023-07-26

Current Status and Emerging Trends on the Adaptive Reuse of Buildings: A Bibliometric Analysis

The emerging demand for sustainable development and the need for efficient use of resources across the built environment have stirred research efforts globally. The construction sector is often regarded as one of the major world consumers of resources, so many international establishments are trying to create a sustainable environment through adaptive reuse of existing building stocks, a concept which has been receiving momentous recognition by reason of its richly diversified applicability for circular economy.

SEE MORE

2023-03-01

How to reduce embodied emissions in municipal construction and lead by example

Almost half of a building's emissions are hidden, embodied in the processes of extraction, manufacturing, transportation, construction, maintenance, retrofitting, demolition and end-of-life treatment. Reducing the impacts of construction and the emissions associated with it will require a significant shift in business-as-usual construction practices.

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Applied Filters

Circularity

Clear all filters

Policy challenge

- [ ] Embodied carbon (99)
- [x] Circularity (72)
- [ ] Operational carbon (44)
- [ ] Chemicals and health (24)
- [ ] Climate adaptation (11)
- [ ] Poverty alleviation (4)
- [ ] Land-use and biodiversity (8)
- [ ] Socially responsible sourcing (6)

Resource type

- [x] Tool (11)
- [ ] Database (6)
- [ ] Case study (5)
- [ ] Research paper (18)

2023-09-11

Reversible Design Checklist

The Reversible Design Checklist is a voluntary design support tool which aims to help building owners and designers in Brussels to create reversible and circular buildings.

The Checklist is available in:

SEE MORE

Resource type

- [ ] Tool (5)
- [ ] Database (3)
- [ ] Case study (4)
- [x] Research paper (8)

2022-11-28

BAMB Materials Passport – Best Practice

This publication by BAMB provides a guideline for actors along the construction value chain to show the benefits of materials passports. Furthermore, an overview is given on material, product and component-related information that is required for a successful transition to a circular economy in the construction industry.

SEE MORE

Climate

- [x] Dry (5)
- [ ] Temperate (2)
- [ ] Tropical (5)

2018-03-13

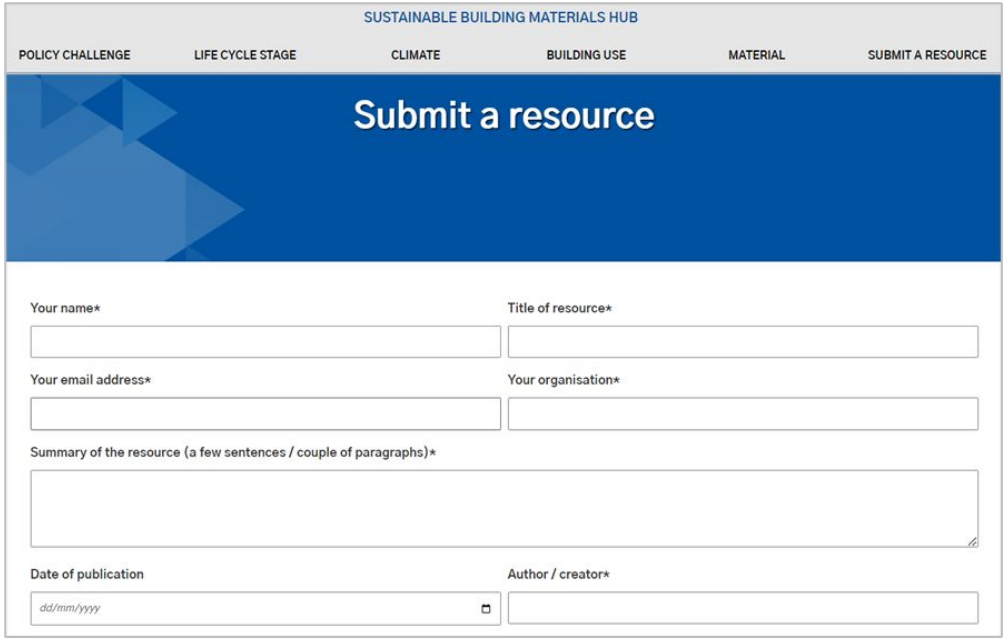
Development of Sustainable Building Materials from Agro- Industrial Wastes in Nigeria

Policy brief presenting information on the development, experimental investigations and practical application of sustainable building materials from agro-industrial wastes in Nigeria, Africa.

SEE MORE

Submitting a resource

- We are aiming to further expand the Hub's resources
- An internal review process is proposed to ensure impartiality and quality
- An increase of free-to-access tools on the Hub is desired
- Resources should aim to promote action at all levels – from local to international



Some positive action has been seen, but a variety of approaches are needed to speed the transition

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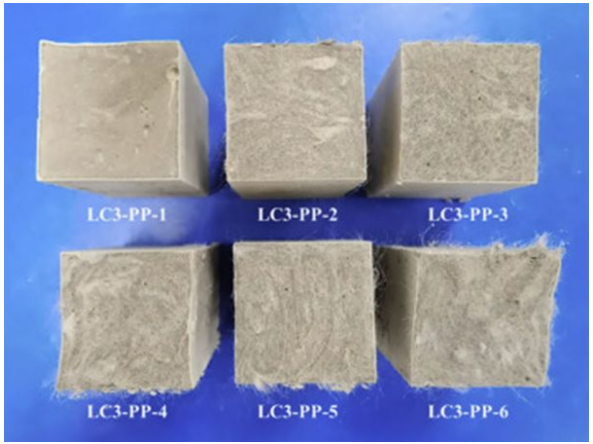
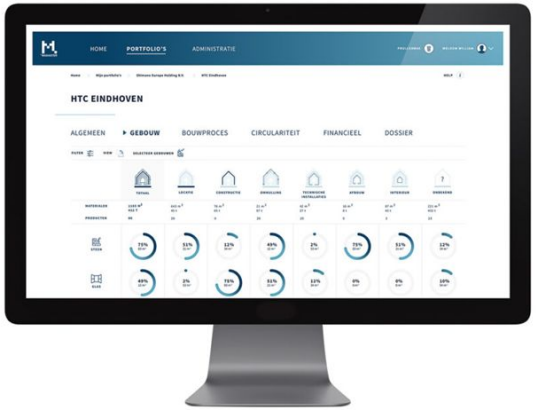
Typhaboard



LC3 - Limestone Calcined Clay Cement



Material Passports

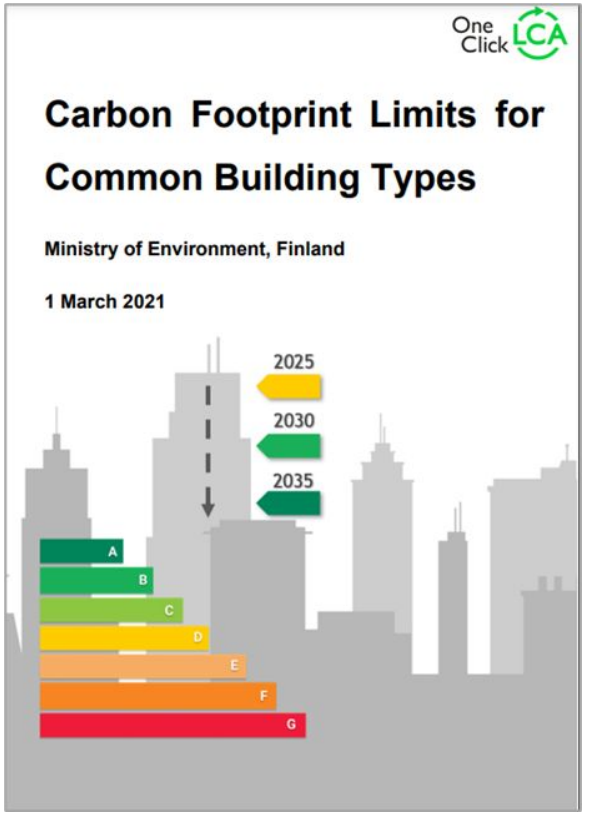
Policies for more sustainable materials

Embodied carbon

- Embodied carbon limits in building codes are being seen in Denmark, Finland, France, Netherlands, New Zealand, USA

Key policies and actions:

- Further building codes
- Access to data and tool development
- Support for EPD development
- Supporting development of procurement criteria and educating procurers



Policies for more sustainable materials

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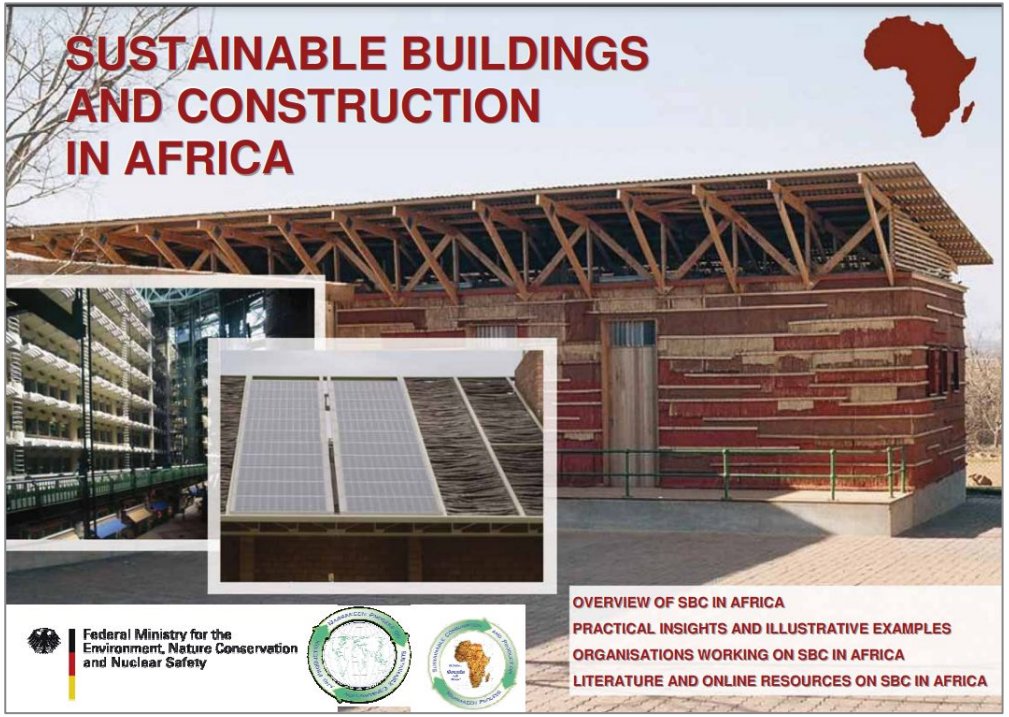
Bio-based materials

- Market stimulation for an economy for bio-based materials is needed

Key policies and actions:

- Government investment for innovation, support for SMEs developing materials
- Standards and test methods, e.g. for earth construction
- Awareness raising e.g. on safety of timber construction
- Forest management, certification, tracking
- Improving gender equity



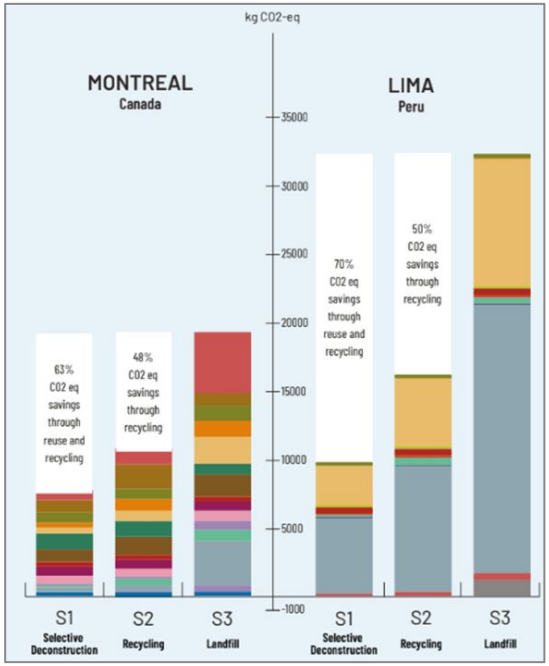
Policies for more sustainable materials

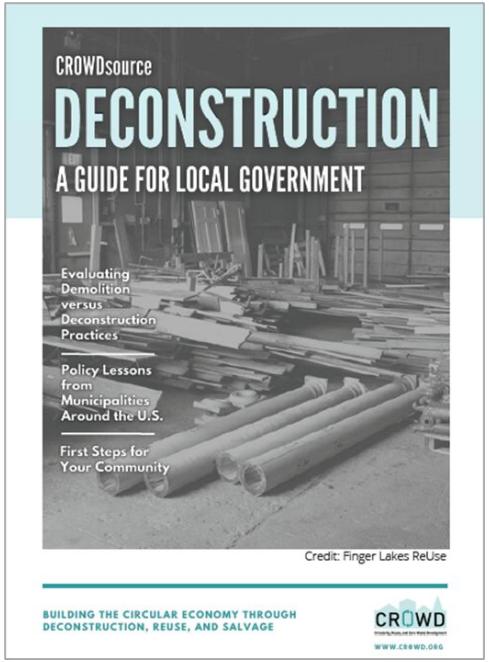
Circularity

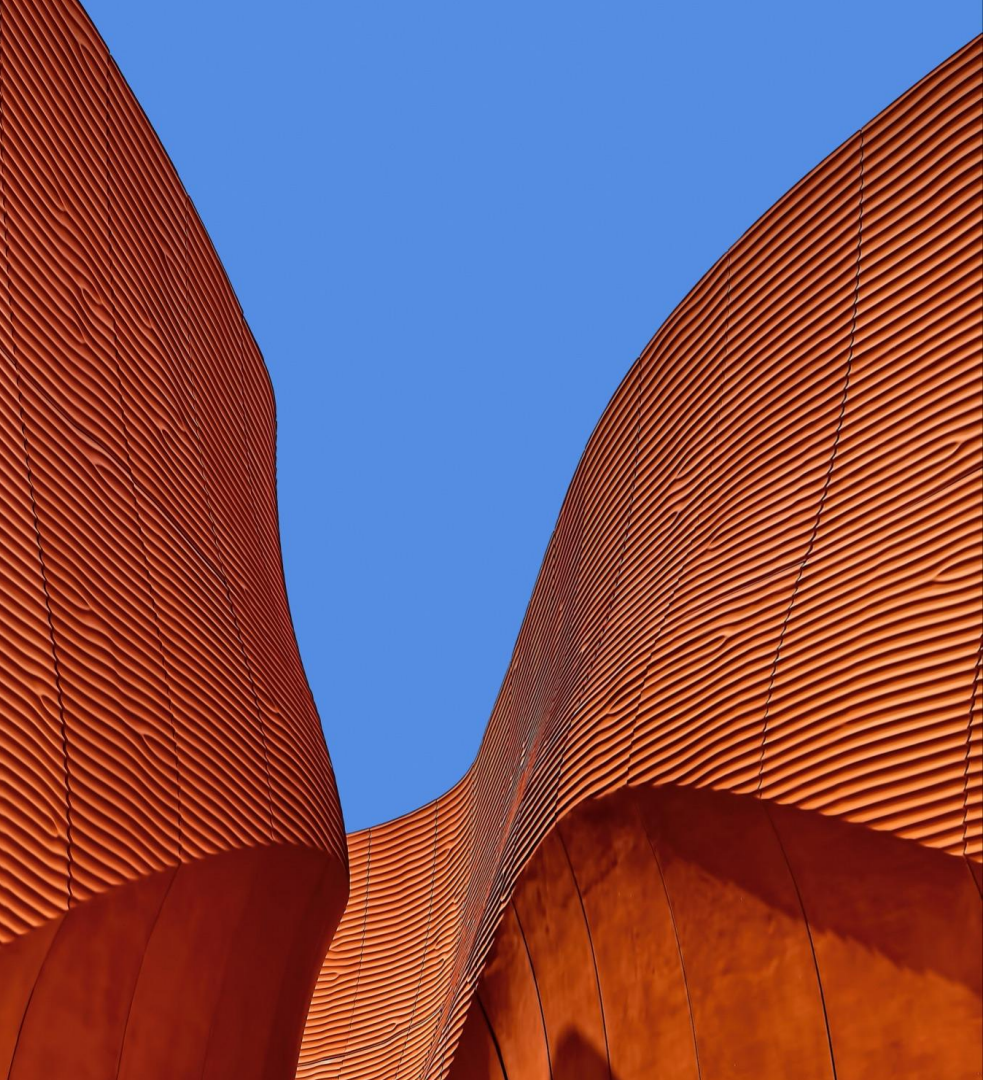
- Deconstruction is not yet the norm and is often more expensive than demolition (if considering only the cost of the service)

Key policies and actions:

- Promoting a full life cycle approach to costing and procurement
- Improved data and Material Passports
- Legal instruments requiring deconstruction audits
- Design for deconstruction in buildings and more circular design of building products







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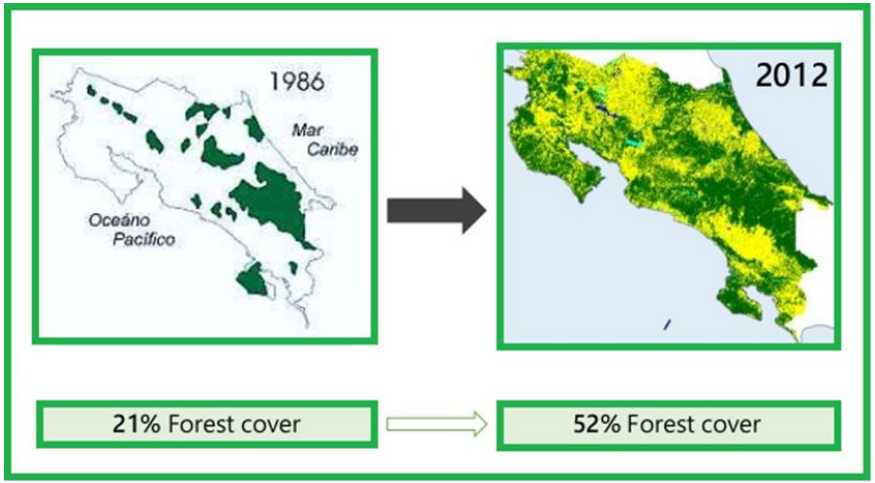
End-user perspective

Nicolás Ramírez, Executive Director, Green Building Council of Costa Rica

GlobalABC/UNEP & Bioregional – 13 September 2023

End-user perspective

Ambitious and effective policy creates a national “sí se puede” (yes we can) attitude



+59%

COVERED IN FOREST

Over 59% of territory covered in forests and 26% of the territory is protected. Costa Rica is the only nation globally to revert deforestation

End-user perspective

National Decarbonization Plan: Major cross-sector commitment, entire Axis focused on Buildings

End-user perspective

Decarbonization Axis 5: Development of buildings of different uses (commercial, residential, institutional) under high efficiency standards and low-emission processes

By **2030**, 100% of **new** commercial, residential and institutional buildings will be designed and built with systems and technologies that lead to low emissions and resilience.

By **2050**, 50% of **all** commercial, residential and institutional buildings will operate under standards of low emissions.

End-user perspective

Updated NDCs: Strategic Area 3-Energy, Strategic Area 4-Infrastructure and Construction

End-user perspective

Updated NDCs: Strategic Area 3-Energy, Strategic Area 4-Infrastructure and Construction

3.3. By 2030, Costa Rica will have developed and/or updated standards and regulations for energy efficiency in end-use technologies to guarantee alignment with the decarbonization goal to be net-zero by 2050.

4.1. Country will increase its use of wood and other local materials produced by sustainably managed forest plantations by a minimum of 10% above the 2018 baseline.

4.2. By **2030**, 100% of **new** commercial, residential and institutional buildings will be designed and built with systems and technologies that lead to low emissions and resilience.

End-user perspective

National Strategy for Circular Economy

- Strategic Axis 5: Circular Construction and Resilient Infrastructure
- Strong emphasis on Certification of Materials (i.e. Cradle-to-Cradle) and Project Certification (i.e. LEED, EDGE)
- Promotes local, low-footprint, recycled and recyclable materials

End-user perspective

GEF8-IP11: Eliminating Hazardous Chemicals from Construction Supply Chains

- National Baseline of Hazardous Chemicals Present in Built Environment
- Outcomes include Regulation to:
  - Prohibit the importing of hazardous chemicals and regrettable substitutions
  - Promote the use of adequate alternatives
  - Insure proper handling and disposal of hazardous chemicals

End-user perspective

Zero Carbon Building Accelerator

- Costa Rica City-Cluster: Belén, Curridabat, Moravia, Santa Ana
- City-Action Plan (Roadmap)
  - Low-Footprint Construction Materials
  - Incentives for Sustainable Projects
- Municipal Sustainable Design and Construction Regulation (forthcoming)

End-user perspective

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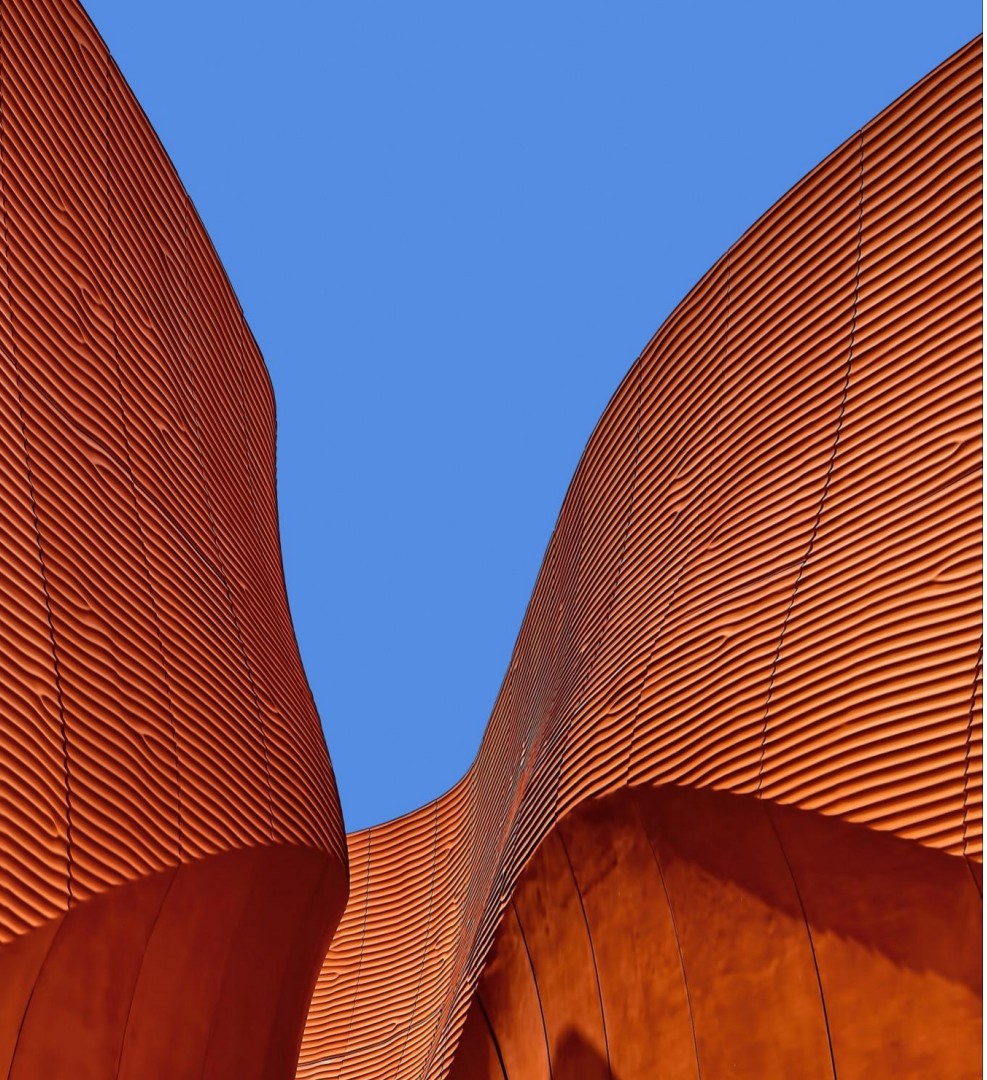
Sustainable Public Procurement and Ecolabeling

- ❏ Updated version of SPP is mandatory for all Public Procurement (centralized and autonomous)
- ❏ RFPs and Adjudication Processes to include additional points for materials with certain certifications and/or third party-verified technical data
- ❏ Strongly aligned with national initiative to promote Ecolabeling and the implementation of EPDs (DAPs)

DAP

GREEN BUILDING COUNCIL C.R. EST. 2012 GBCCR



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Q&A

Sustainable Building Materials Hub

Launch event: World Green Building Week 2023

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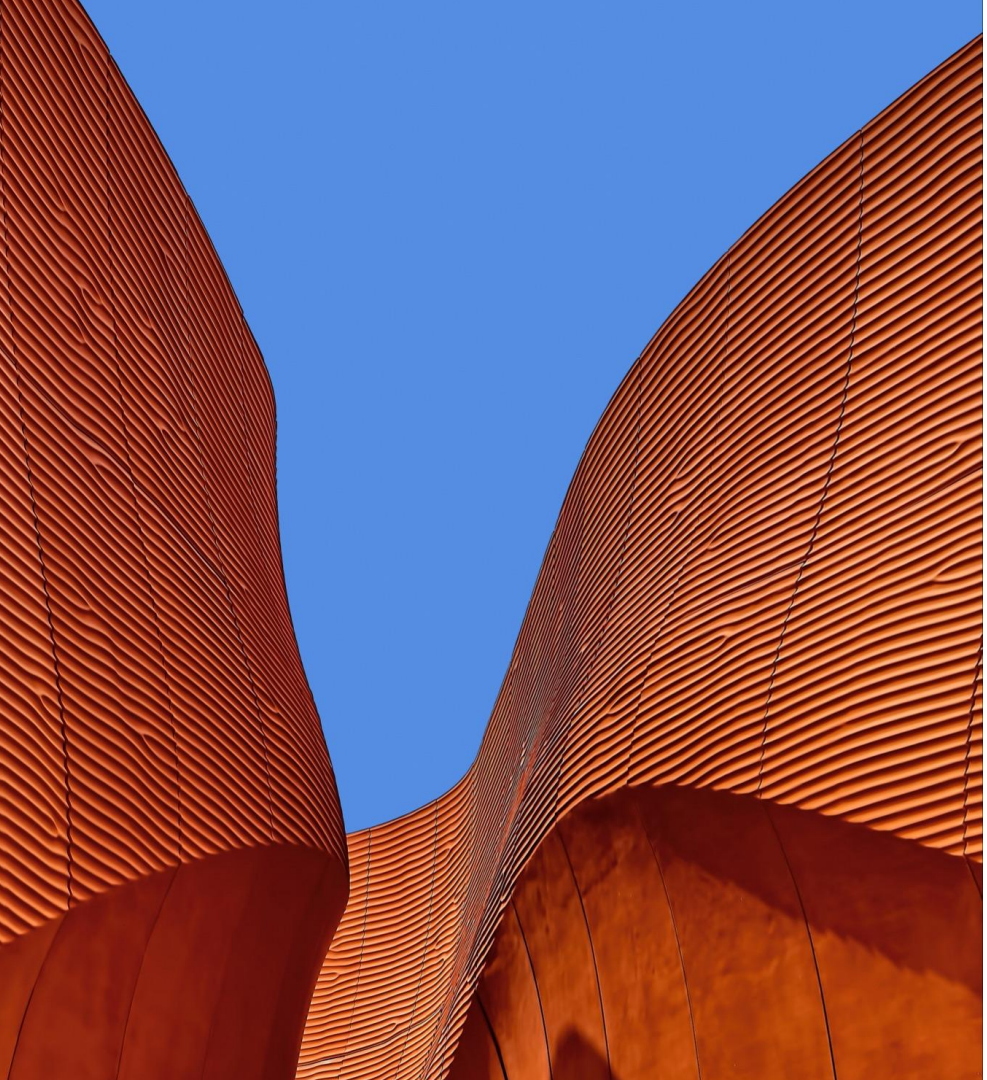

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Thank you!

Launch event: World Green Building Week 2023

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