

An aerial photograph of a dense green forest. In the center, a body of water is shaped like a house, with a triangular roof and a rectangular base. Inside the house shape, there are two smaller islands of trees, one square and one rectangular, representing windows and a chimney. The water is a clear, light blue color. The surrounding forest is lush and green, with some mist or fog visible in the lower right corner.

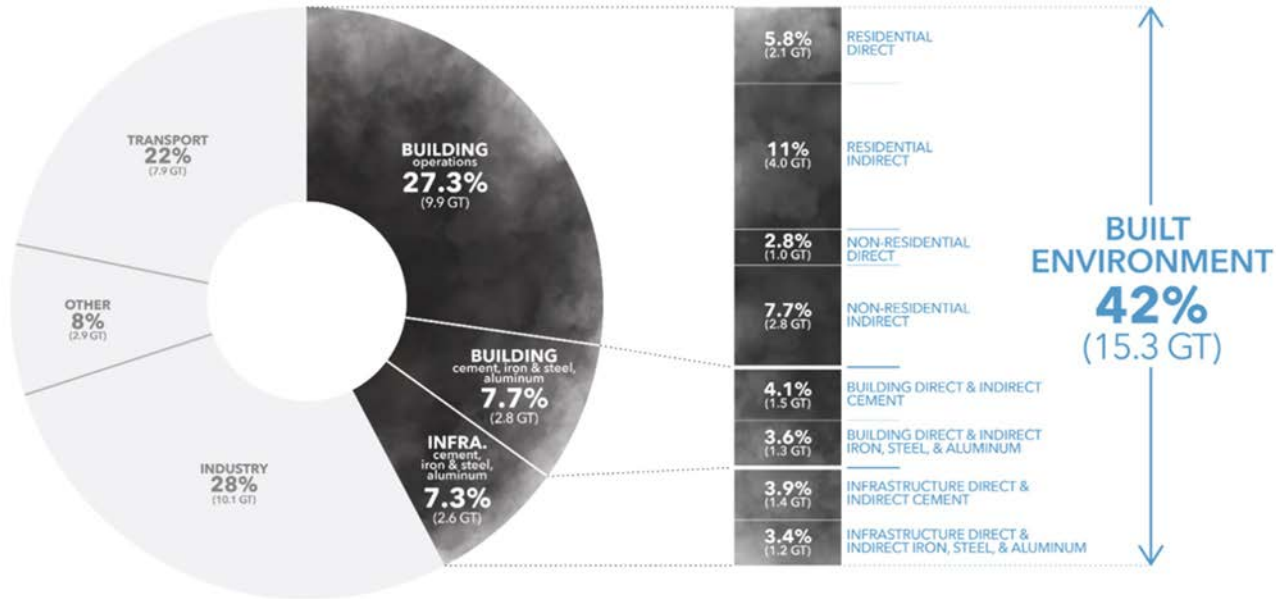
CWSC, Centre of Worldwide Sustainable Construction

Anne
Dekeukelaere

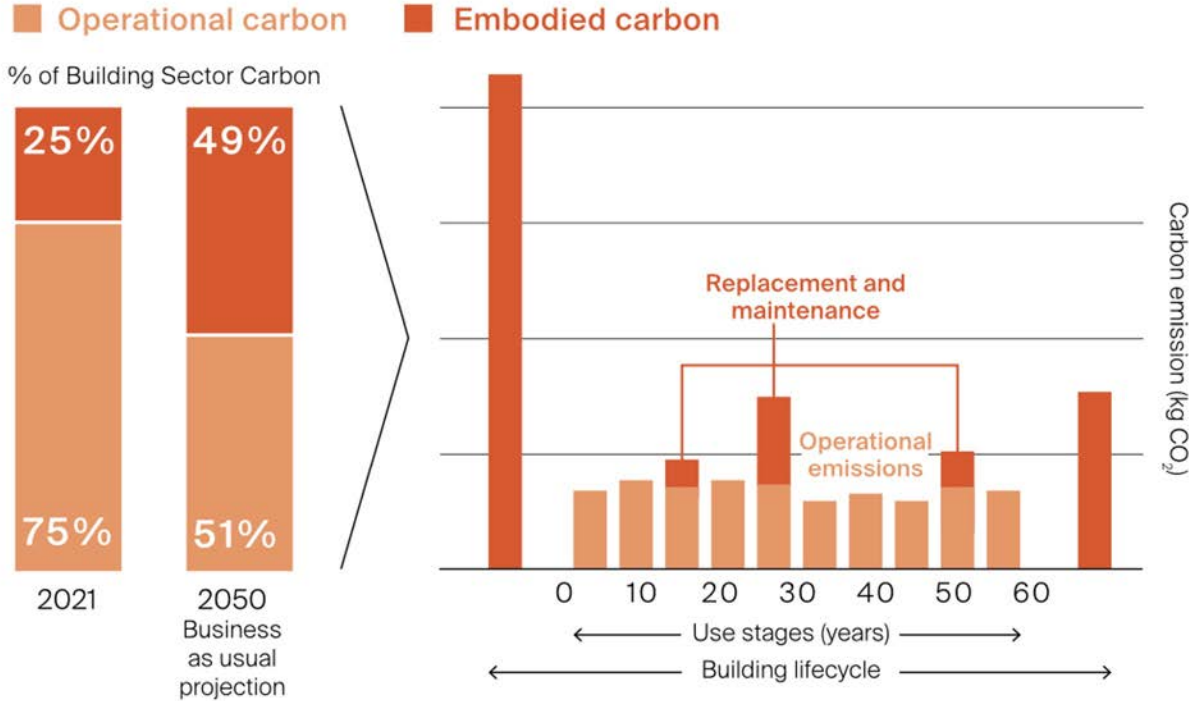
16.05.24

Embodied Carbon emissions is becoming the primary source of Carbon impact from buildings

TOTAL ANNUAL GLOBAL CO₂ EMISSIONS
Direct & Indirect Energy & Process Emissions (36.3 GT)

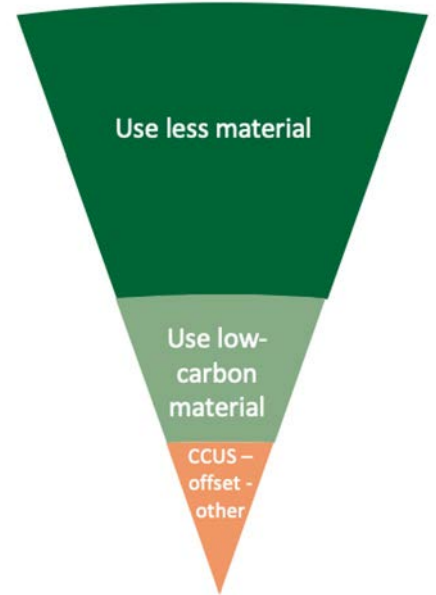
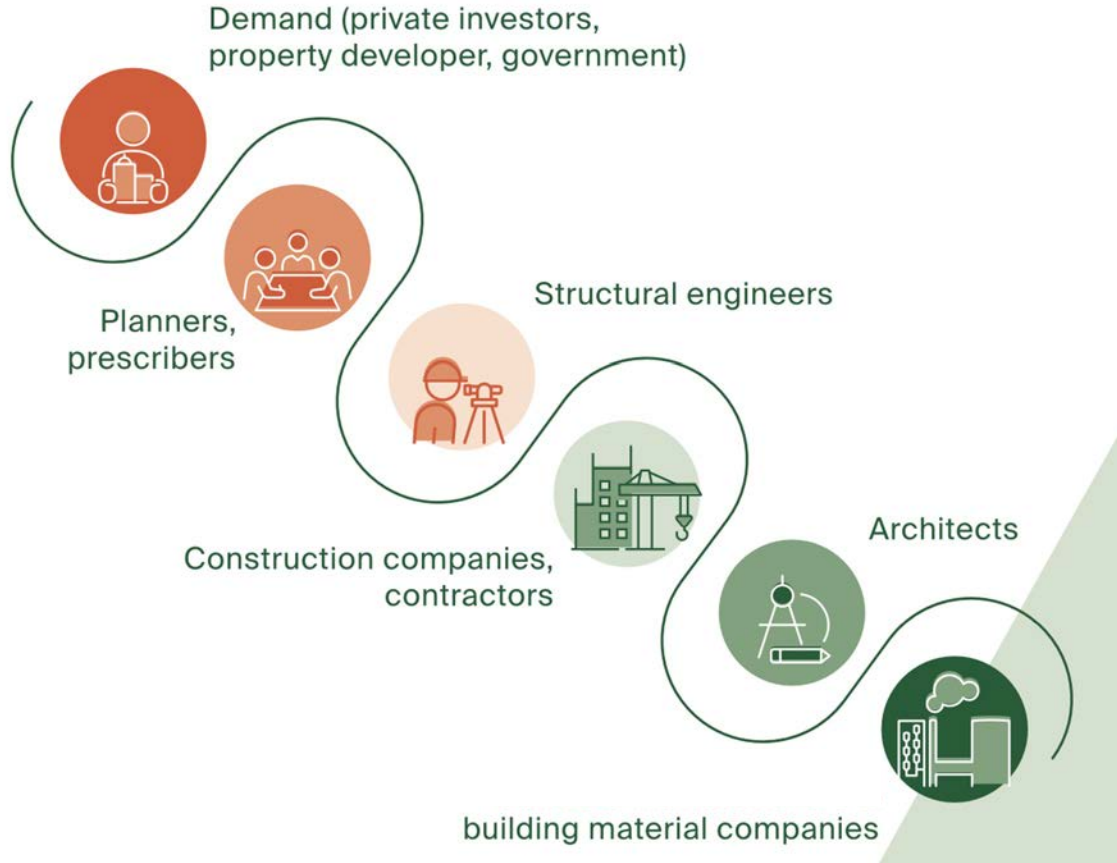


Projected Contributions from Embodied and Operational Carbon within the Building Sector



Source: GlobalABC: Sustainable Building Materials Hub

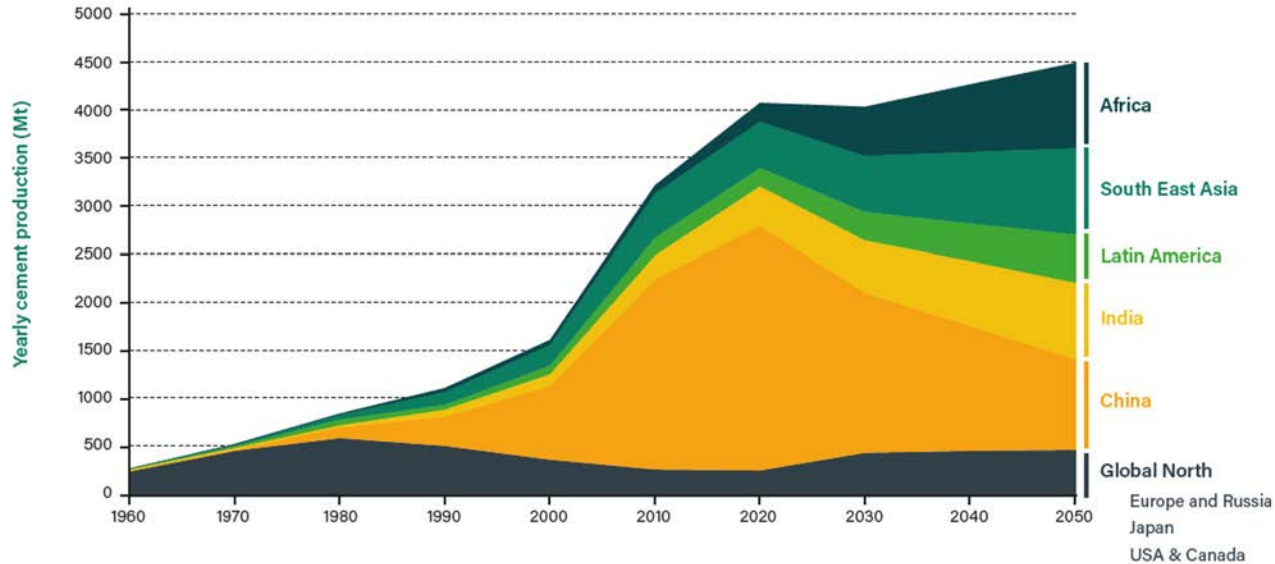
Value Chain



Changing pattern of cement use:

Cement based materials are more than two thirds of all construction

Historical and forecast cement supply per region



We need solutions for people in developing countries



Fribourg campus

Scientific focus

Creation of 4 Chairs

- Professors (PATT) hired 2016-2022
- +1 new hire planned
- 2 architecture, 3 civil engineering

52 staff

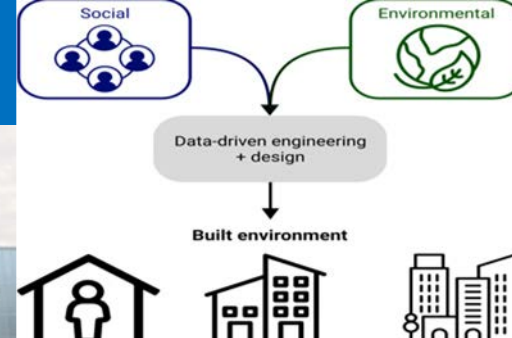
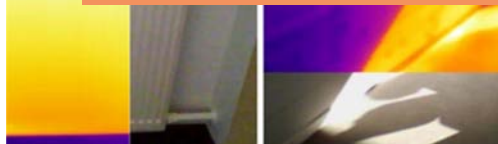
Development of the Smart Living Lab

A unique combination of programs: architecture + engineering

Prof. Corentin Fivet
Structural Xploration Lab
– SXL



Prof. Dolaana Khovalyg
Laboratory of Integrated
Comfort Engineering – ICE

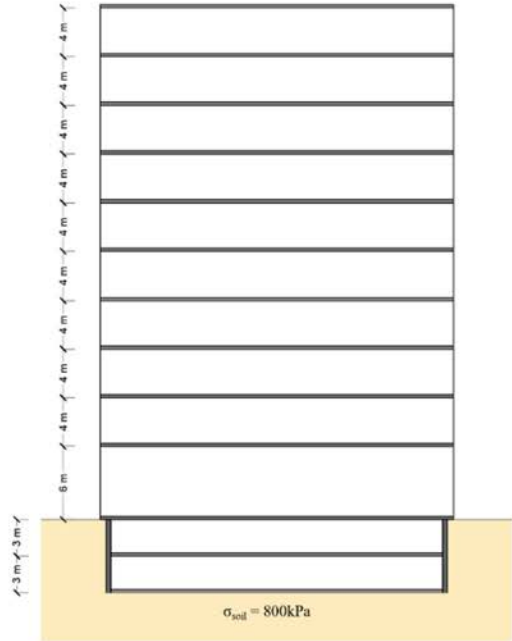


Prof. Andrew Sonta
Civil Engineering and Technology
for Human Oriented Sustainability
Lab – ETHOS

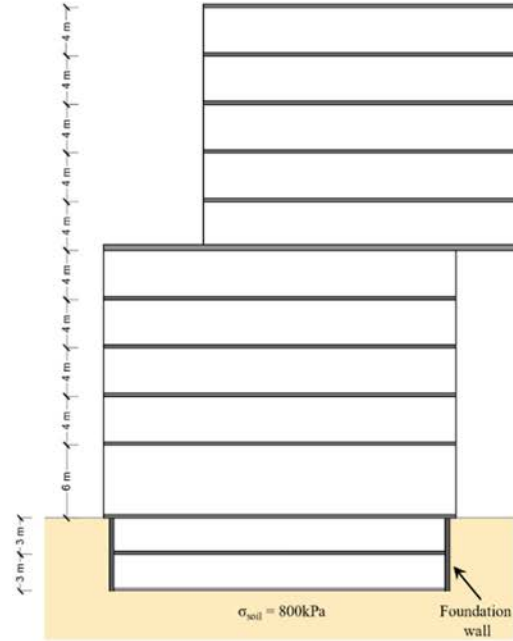


Prof. Dusan Licina
Human-Oriented Built
Environment Lab – HOBEL

Carbon cost of irregularity



VS.

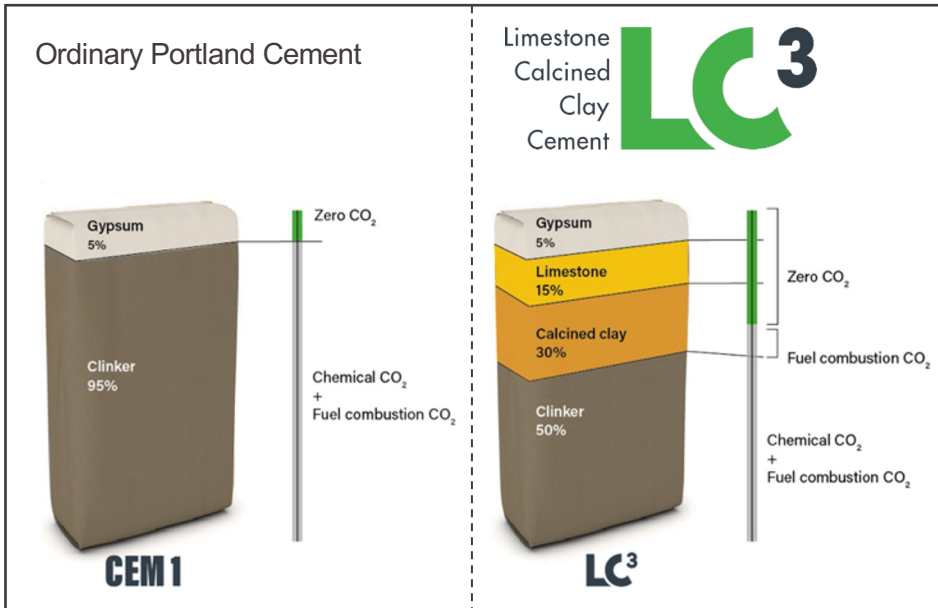
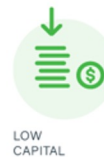


~50% more embodied carbon on average

Example: demolition waste re-use



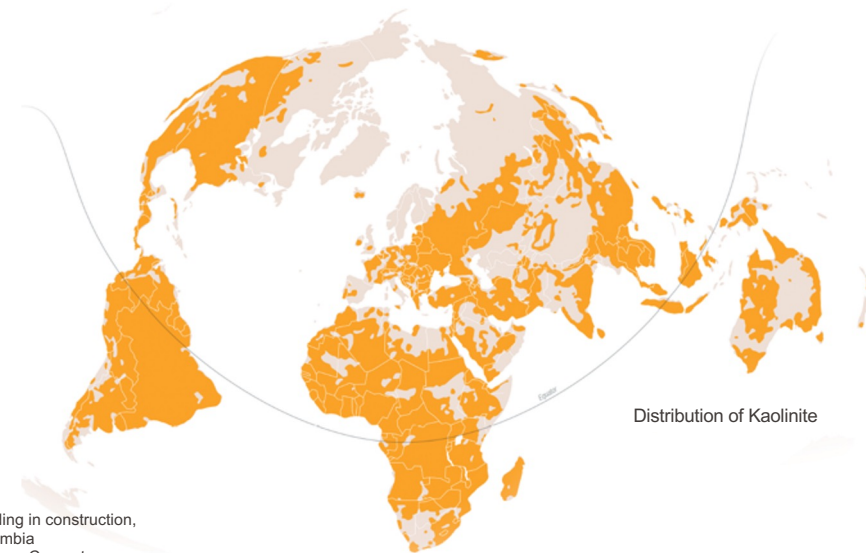
EPFL LC³ – Limestone Calcined Clay Cement



LC³ is a **low-carbon** blended cement type
Reduces CO₂ emissions in cement by 40%

Produced today in **9 plants** worldwide; +20 more by 2025

Can save **500 million tonnes of CO₂** by 2030



Building in construction, Columbia © Argos Cements



Schweizerische Eidgenossenschaft
 Confédération suisse
 Confederazione Svizzera
 Confederaziun svizra




Swiss Agency for Development and Cooperation SDC

Timeline for recruitments & Education




- Executive Director and Advisory Board in place
- 2 professors in place
- 4 professors in place
- 6 professors in place
- 7 professors in place



- Doctoral School
- Minor Master in place
- Continuing Education in place

Partner Universities



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA - UNIVERSITEIT VAN KAAPSTAD



IIT MADRAS
Indian Institute of Technology Madras

GREEN PUBLIC PROCUREMENT
A CAMPAIGN OF THE CLEAN ENERGY MINISTERIAL

INDUSTRIAL DEEP DECARBONISATION
AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

Construction materials like steel, cement and concrete are the building blocks of our modern world

Green Public Procurement (GPP) is a process where public authorities seek to source goods, services or works with a reduced environmental impact



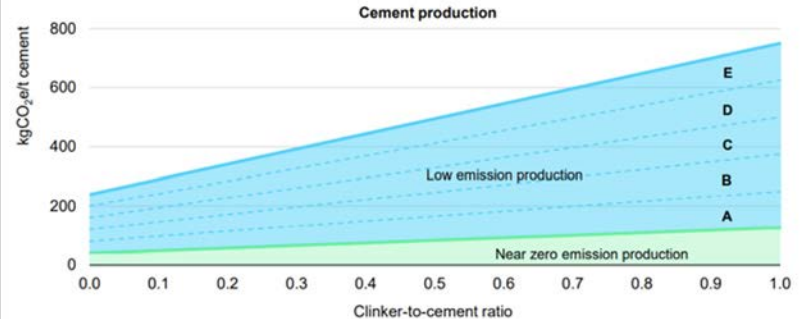
BREAKTHROUGH
AGENDA

BREAKTHROUGH COUNTRY CO-LEADS

CEMENT & CONCRETE Canada + UAE

Endorsing Countries
Canada, UAE, Germany, Ireland, Türkiye, UK, Switzerland, Congo, Kenya, (Thailand)

IDDI – low carbon definition





**Thank
You**

Anne Dekeukelaere