Benchmarking of Resource Use and Embodied CO_2 in Buildings

GLOBE Consensus Workshop at EPFL Lausanne (CH), 13-14 February 2023

The objective is to set the foundation for global benchmarks on the carbon footprint of buildings, based on a joint methodology for assessing and reporting embodied impacts in an attempt to generate globally harmonized yet location-specific benchmarks. Measuring and benchmarking is a key strategy to reduce the resource use and CO2 footprints of the global building stock. A global standard will allow to compare and learn from the wide variety global design and construction practices, fostering research and innovation which are crucial to our common climate ambitions.

The work capitalizes on broad geographical representation and expertise in the GLOBE initiative, especially from the Global South, where the majority of urbanization until 2050 is expected to take place. With reduced emissions for building operation and reduced material needs for façades, the main impact from construction would come from the building structure. The group will work to develop streamlined documentation requirements for the impact assessment and benchmarking process that could be linked to existing structural design and building information modeling (BIM) software solutions.

The focus is benchmarking embodied impacts (material use, embodied energy and carbon) of buildings, which are little known and growing in importance as the in-use energy efficiency increases. The goal is to create a generic yet robust methodology that complements existing methodologies and supports global implementation.

Three main aspects will be targeted at this GLOBE Consensus Workshop

a) *Design a strategy to deploy a global protocol* to facilitate global benchmarking of structures and buildings, including the identification of existing global initiatives, standards and tools, main stakeholders to be engaged, necessary actions, and next steps.
b) *Propose minimum data requirements* for a global embodied impact assessment and reporting methodology to allow for consistent benchmarking of the environmental performance of building structures.
c) *Discuss the automation of data processing and exchange,* including machine-readable data protocols and integration with existing architectural and structural modeling tools.

Proposed agenda for the workshop

Day 1 (13th Feb 2023)

Timing	Description	Responsible
08:30	Opening statement on the workshop objectives and dynamics	Vanderley John
08:45	Inputs (10 min presentation + 5 min discussion) ● **Martin Röck (KU Leuven, BE)** Benchmarking Embodied Carbon of European Buildings - Research Perspective on Data Collection and Benchmark Analysis ● **Michael Haist (Hannover University, DE)** Construction Product Manufacturers Perspective on Data Provision, EPDs ● **Will Arnold (IstructE, UK)** Structural Design Professionals Perspective, Building Design Process Integration, Legislative Initiatives (UK) ● **Ricardo Franca (USP, Brazil)** Structural Design Professional Perspective, Design Optimization Potentials and Parameters ● **Cyrille Dunant (University of Cambridge)** Halving the embodied carbon of projects in the first afternoon: generating design spaces and collaborative design ● **Francesco Pomponi (Building Transparency)** Tool Developer's Perspective: Data Provision (EPDs) and Design Integration of Embodied Carbon Assessment	Chair: Karen Scrivener
10:15	Coffee break	-
10:30	Group discussion: **Initial ideas on existing methods, data, tools and benchmarks**	Karen Scrivener
11:00	Parallel sessions: Collect information from the **practical experience of participants**, including useful **references and examples** about the following topics: 1. Scope definition 2. Building/structure description 3. Material data sources 4. Building inventory 5. Impact assessment 6. Relevant parameters and indicators to report 7. Data exchange format Stakeholder perspectives ● A: Structural design and building design professionals ● B: Construction product manufacturers and construction companies ● C: Science to policy, regulatory frameworks for decarbonization	Facilitators: Vanderley John, Guillaume Habert, Martin Röck
12:30	Lunch break	-
13:30	Presentations and discussion of parallel session insights	Groups, All
15:30	Closing remarks	Karen Scrivener
16:00	End of day 1	-

Day 2 (14th Feb 2023):

Timing	Description	Responsible
08:30	Welcome	Vanderlery John
08:45	Group discussion: Reflections on day 1	Karen Scrivener
09:15	Parallel sessions (same leaders as day 1): Develop proposals for minimum, recommended, and ideal requirements for assessing, reporting, and benchmarking the embodied impacts of building structures, including: 1. Scope definition 2. Building/structure description 3. Material data sources 4. Building inventory 5. Impact assessment 6. Relevant parameters and indicators to report 7. Data exchange format	Facilitators: Vanderley John, Guillaume Habert, Martin Röck
10:15	Coffee break	-
10:30	Presentations and discussion of parallel session insights	Groups, All
11:30	Group discussion: Plans for knowledge transfer nodes globally and real case studies	Karen Scrivener
12:30	Lunch break	-
13:30	Group discussion: Plans for the next stage, working sub-group duties, dates for next workshop	Vanderley John
14:30	Concluding remarks	Karen Scrivener
15:00	End of day 2	-