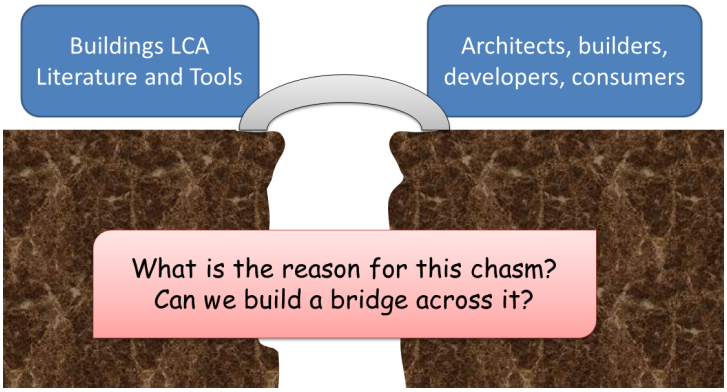
Views on LCA from Buildings Experts

Problem

Robust buildings LCAs can support environmental design decisions for building assembly and material selection. Currently, there exists a "chasm" between buildings LCA research creating literature and tools and the utilization of this research by buildings practitioners.



Approach

To gain an understanding of the reasons for this chasm, our team conducted three focus groups and brief surveys with a few dozen architects and structural engineers from several Boston-area firms in Spring 2013. Outcomes from a similar workshop on "Metrics and Tools for Sustainable Buildings" conducted in 2011 by NIST were reviewed.

Findings

Lack of demand for whole building LCAs.
Most clients are not requesting whole building LCAs, and most firms do not offer them due to perceived difficulty.

Client interest in environmental design and concern for payback periods vary considerably.
Some clients have high expectations and preconceived targets in terms of environmental design, some are most concerned about their design in comparison with others in the region, and others are disinterested. Most participants agreed that five years is considered a reasonable payback period for environmentally preferable design features; some clients do not set limits.

Mandatory codes are insufficient to meet goals; an inconsistent set of sustainability performance metrics are considered for different buildings.
While some firms design projects to meet environmental targets such as Architecture 2030 and LEED, most local building codes do not require comparable environmental performance. The choice of voluntary targets and sustainability performance metrics is dependent on client requirements and firm practices and standards. Use phase energy and carbon emissions are the most common metrics, while water usage, material-specific occupant health impacts and material durability are also increasingly investigated.

Environmental trade-offs between phases do not seem to be considered in design decisions.
Some materials within building assemblies may have a higher embodied and end-of-life environmental impact than associated use phase energy reductions. Models used by firms do not to capture these tradeoffs.

Local labor pools and construction practices impact building assembly selection and building outcomes.
Whereas designers specify quality and monitor construction progress, the skillset of the local labor market and the experience of builders with different building assemblies will influence the materials used, how buildings are actually built and whether they meet the defined environmental metrics.

Modeling tools are either comprehensive and cumbersome or overly simplistic and user oriented.
Many participants reported frustration with tools' extensive data input requirements early in the project, or conversely unreliable results. Sending modeling projects to third-party engineering firms was common.

Impact

A consistent set of robust, clear sustainability performance metrics with associated payback periods need to be available to designers early on in the design to influence truly environmentally preferable decisions. Tools or datasets could be collaboratively developed to further this objective.

More

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