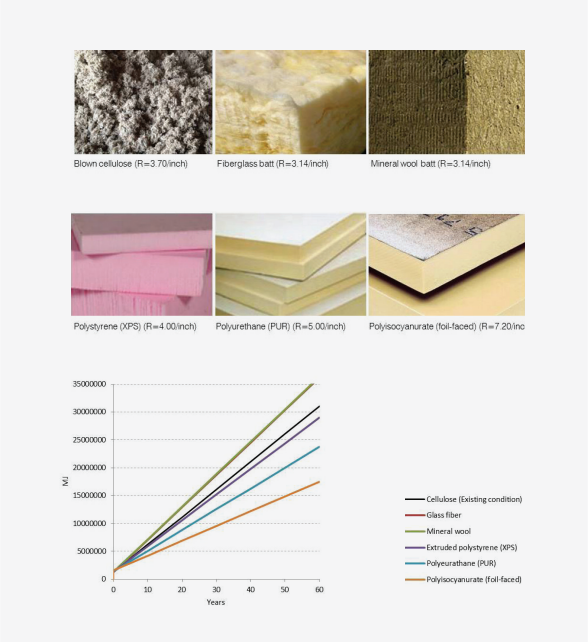
HARVARD
CENTER FOR GREEN
BUILDINGS AND CITIES

Insulating Retrofits:

Life cycle trade offs

PROBLEM

Reductions in building energy consumption are traditionally achieved, among other means, through an increase in insulating envelope materials. This type of solution tends to ignore the high energy intensity associated with the production of insulation and other envelope components. Supporting design decisions that consider both operating and embodied energy requires further understanding of the tradeoffs between low thermal conductivity and energy-intensive extraction and manufacturing processes. This project intends to address this knowledge gap by studying the influence of specific design decisions on both energy and environmental indicators throughout the life cycle of timber frame buildings.



GUIDING QUESTIONS

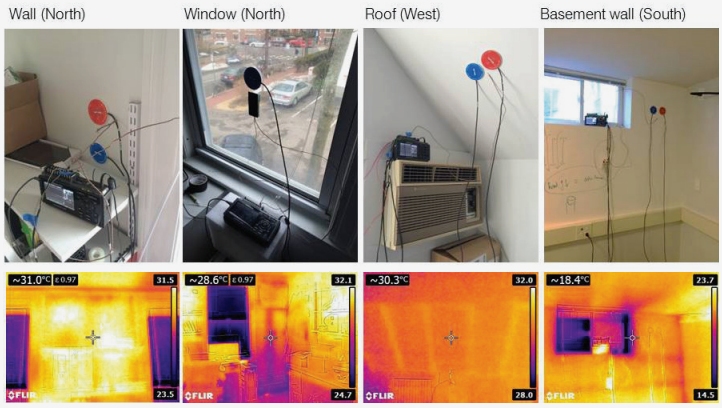
This research ask how one can best determine the energy and/or carbon life cycle trade offs that will result from particluar envelope design decisions.

Is there a linear relationship between embodied & operating tradeoffs in timber frame buildings?

How might this tradeoff affect envelope design decisions?

PROJECT DESCRIPTION

The project aims to develop a methodology for assessing energy and carbon trade-offs in timber frame buildings. A main goal of this work is assisting designers in developing low life cycle impact building envelopes.



IMPACT

The project has the potential to impact the industry in multiple ways: First, by raising awareness to the growing importance of embodied emissions in net or almost net zero emission developments; second, by providing a platform for future regulation with regards to embodied emissions; third, by pushing the industry to develop new insulation materials that could provide greater thermal resistance with lower embodied impacts; and fourth, by encouraging more local material consumption in the construction industry.

Emphasize the importance of considering embodied emissions in net-zero projects.

Provide foundations for the future regulation of embodied emissions.

Advance the development of insulation materials with low-embodied emissions.

HARVARD
CENTER FOR GREEN
BUILDINGS AND CITIES

CONTACT

20 Sumner Road
Cambridge, MA 02138
tel. 617-495-8807
fax. 617-496-4408
email: cgbc@gsd.harvard.edu