

A Case for Comfort

Integrating Energy Efficiency and Universal Design in Home Renovations

Introduction

Energy Efficiency (EE) and Universal Design (UD) are high on governmental policy and research agendas. However EE and UD are largely treated separately in research and practice and have reached only limited adoption in society. This is a missed opportunity for renovation concepts with higher value and lower costs and inconvenience. Based on a literature review, we observe that the goals of governments and policymakers in regards to home renovations, i.e. increasing EE and UD adoption to solve certain societal challenges, are misaligned with those of people, who aim to increase their comfort (Fig. 1). We take a user-centered approach and make use of the concept of comfort to integrate UD and EE. This poster describes our investigation of the meaning of comfort in home renovations.

1. Problem

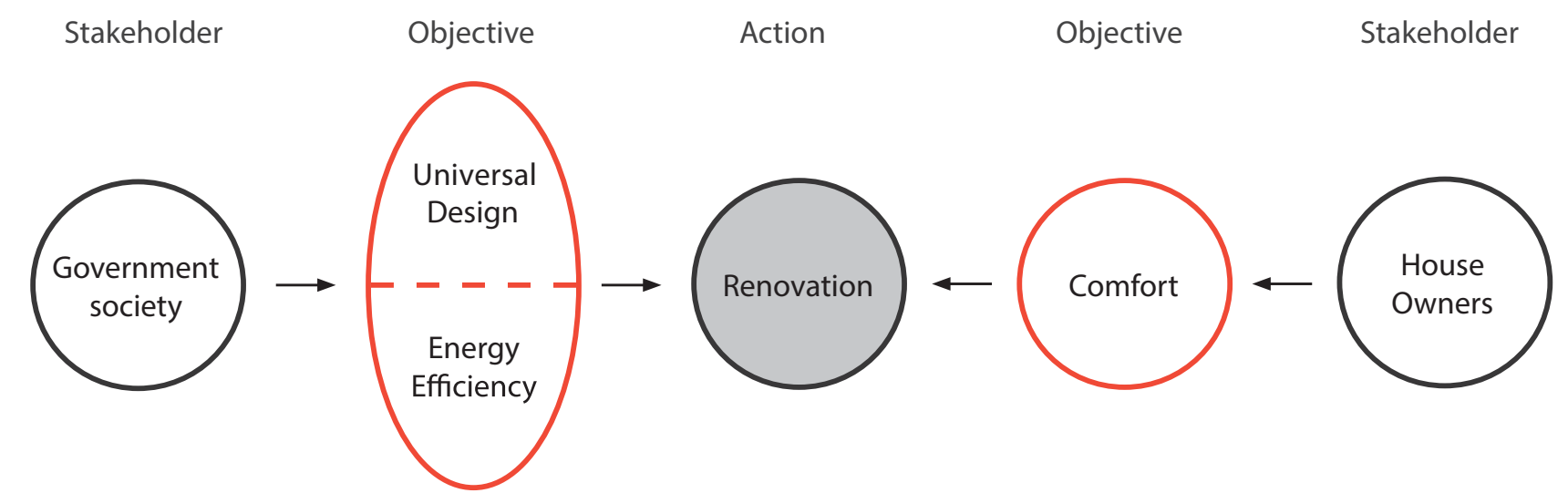


Fig 1. A mismatch of objectives between homeowners and government

2. Comfort: The literature

Comfort in EE:

- Indoor Environmental Equality: air, temperature, noise, light.
- Fixed, defined and measurable
- Technology-centered solutions

Comfort in UD:

- A UD goal: biomechanics (as defined by Steinfeld & Maisel)
- An implicit objective of UD
- Multifaceted & user-centered

3. Comfort: Residents' perspective



Fig 2. Word-cloud of comfort related topics mentioned in the Include 2015 workshop.



Fig 3. Word-cloud of comfort related topics in interviews with 10 homeowners



Fig 4. Word-cloud of topics mentioned during a home walkthrough with 10 homeowners



Fig 5. Words used by architecture students to describe a comfortable space at home

Three qualitative studies were carried out to elicit the meaning of comfort at home from the perspective of residents: UD professionals at *Include 2015* (Fig. 2), Flemish homeowners (Fig. 3 & 4), interior architecture students (Fig. 5).

Results show that:

- Comfort associated with both EE-related and UD-related aspects.
- EE aspects not seen as separate but as part of UD.

4. Comfort - What it could be

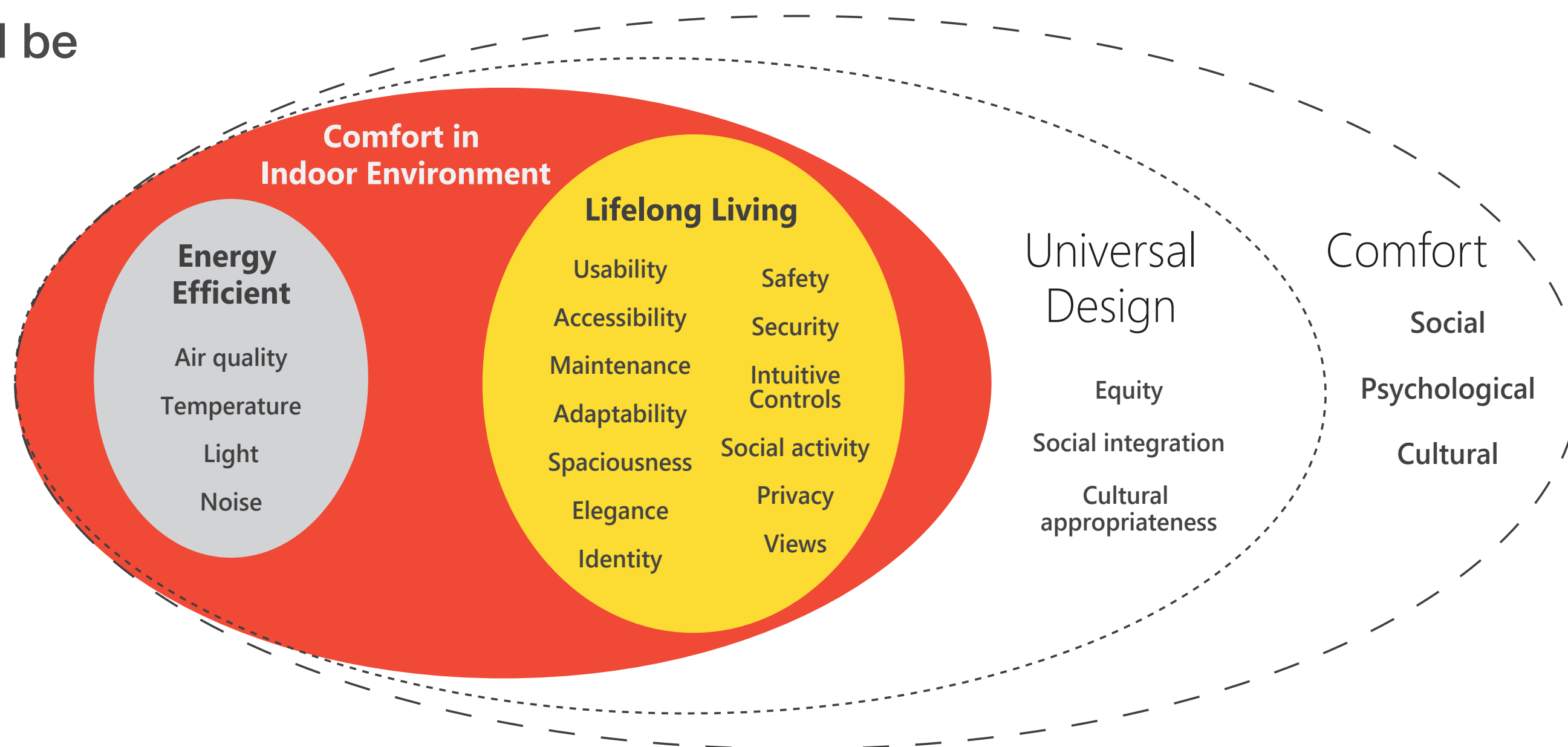


Fig 6. A framework for Comfort in Indoor Environment as integration of EE and UD

The literature and qualitative studies reveal three insights:

- Comfort as a combination of Indoor Environmental Quality indicators.
- Comfort at home as overlapping with UD goals
- Comfort as an implicit central objective of UD

The concentric relationship between IEQ, EE, UD and Comfort is illustrated (Fig. 6). Indicators of Comfort in the Indoor Environment, an integration of EE and LLL indicators, are covered by most goals of UD, which in turn contains aspects of a very broad concept of comfort.

Conclusion

Framing discussions on EE and UD as part of Comfort in the Indoor Environment implies a focus on the benefits of home renovation from the perspective of residents. It uses a language that can be more understandable and motivating for lay-people, while at the same time containing the core messages on EE and UD important to professionals, such as academics, policy makers, and designers. The framework brings together the individual objectives of people making decision on their home renovation with the objectives of professionals and society at large.

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