An approach to support informed multi-criteria decisions for collective energy retrofitting in historic buildings

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An approach to support informed multi-criteria decisions for collective energy retrofitting in historic buildings

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Context and motivation

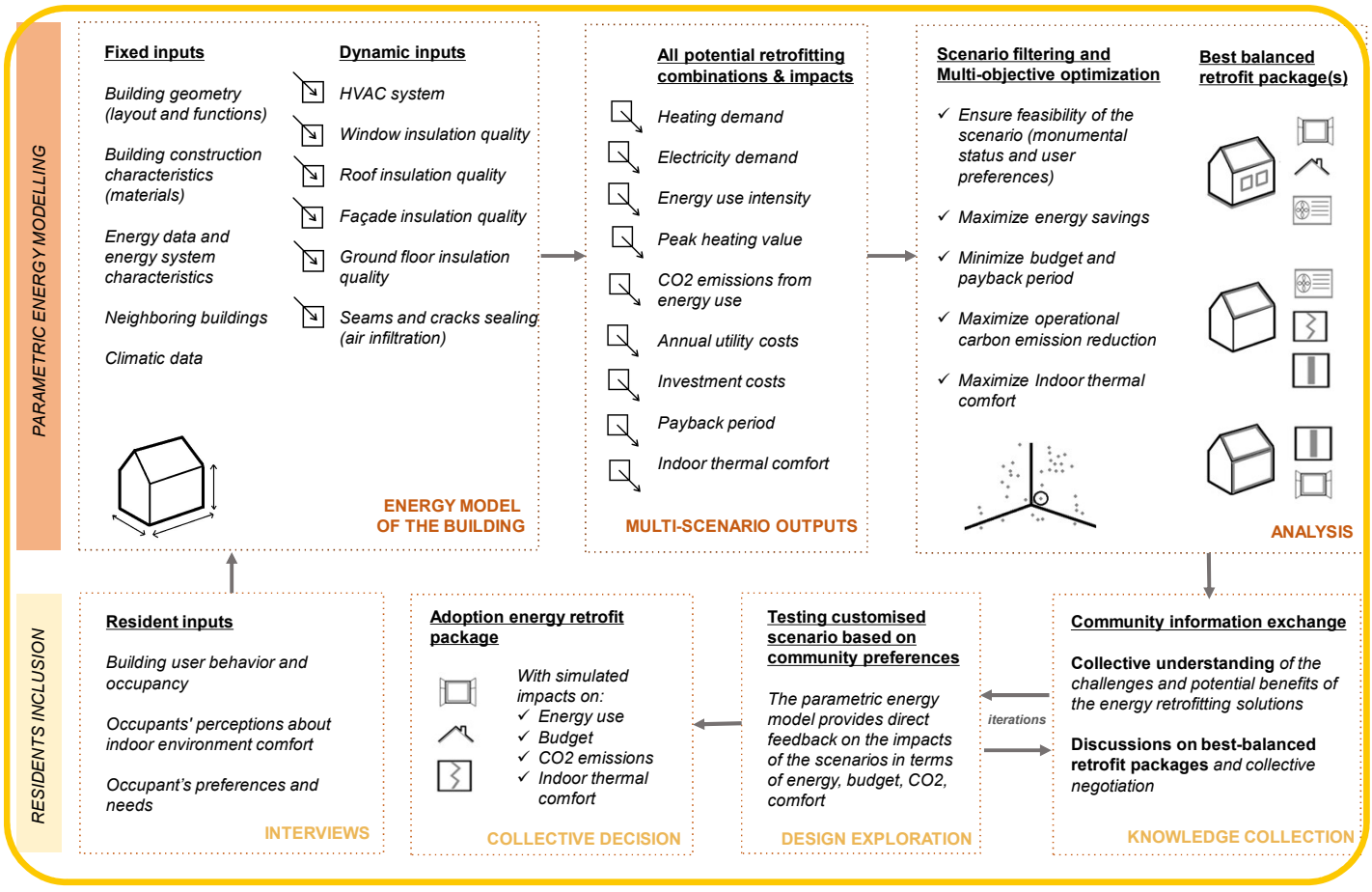
- **Large scale retrofitting activities insulating multiple households at once** is urgently needed to reach the climate agreement goals;
- There is a **fragmented response to the energy retrofitting challenge** with negligible levels of energy efficiency improvements conducted by multiple actors;
- Homeowners find **difficult to find reliable information** on energy retrofitting: **no standardized approach to conduct historical building retrofits**, making the process long, expensive and unattractive;
- Parametric energy modelling is **technically focused**, lacking an **integrated participatory approach** to develop feasible energy concepts for communities.

Objectives and research questions

- **Designing an optimization-based decision support approach to define collective energy retrofitting strategies** in two communities in the city centre of Amsterdam;
- **Collecting insights on decision-making** in community investment;
- **Developing knowledge on how to upgrade historical buildings to a Low temperature level** (< 50 degrees).

What **cost-efficient and collective energy retrofit solutions** are suitable for historic buildings?
How to **optimally integrate communities** into the design process?

Proposed Methodology



Preliminary findings

- A flexible parametric energy model to support collective decision-making process has been developed. The model provides **best-performing retrofit packages, which can be adapted to changing parameters** (eg. budget, energy prices, CO2 emissions, expected indoor comfort and energy savings) together with the community.
- **Giving insights on improved indoor comfort increases the negotiation space**, which is often primarily focused on budget and payback period of the energy retrofitting scenarios.

The research is part of "Collect Your Retrofits" project, a collaboration between Superworld, AMS Institute & TU Delft

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