

# DYNAMIC DWELLINGS AS INNOVATIVE AND SUSTAINABLE RENOVATION CONCEPT

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## ► RESEARCH INFORMATION

### KEYWORDS

Sustainable, dynamic concepts, cost-efficiency, living comfort, energy-efficiency, material use

### INTRODUCTION / CONTEXT

In general there is a growing awareness for energy-efficiency which has led to the Flemish energy legislation "EPB" in 2006.

① **Focus on energy-efficient** measures lowered our energy consumption but raised new problems

➤ Higher **embodied environmental impact** and higher buildings **costs** because of the **large quantity of additional materials** and techniques

In addition **the traditional Flemish dwelling**

➤ has a **higher average living space** than EU average which has not been taken under consideration by EPB and because of the static nature of the dwelling, insulation and heating system are applied in a way that **the whole building volume has to be heated**

### QUESTION / GOAL

These problems and challenges give us an **opportunity to respond** to the need for change and new housing types

② Through innovative, sustainable concepts that **transform** our traditional **static dwelling** to a more **dynamic dwelling**

➤ where the large **living space** is being **used dynamically** along the **seasons** so that it is **heated more efficiently**, a **lower material input** is needed and the dwelling becomes more **cost beneficial**. The **optimal comfort** and **spatial quality** must be guaranteed

The **connection between the dwelling, its surroundings and the residents** becomes essential

➤ **Exploring the spatial boundaries** of the dwelling (dynamic) Connecting with the natural elements (**seasonal change**) And **supporting and guiding the residents** when applying sustainable concepts (behaviour and living pattern becomes important)

➤ Through **dynamic, climate-responsive strategies** and insights in **user centred design methodology** (Universal Design)

### HYPOTHESIS / METHODOLOGY

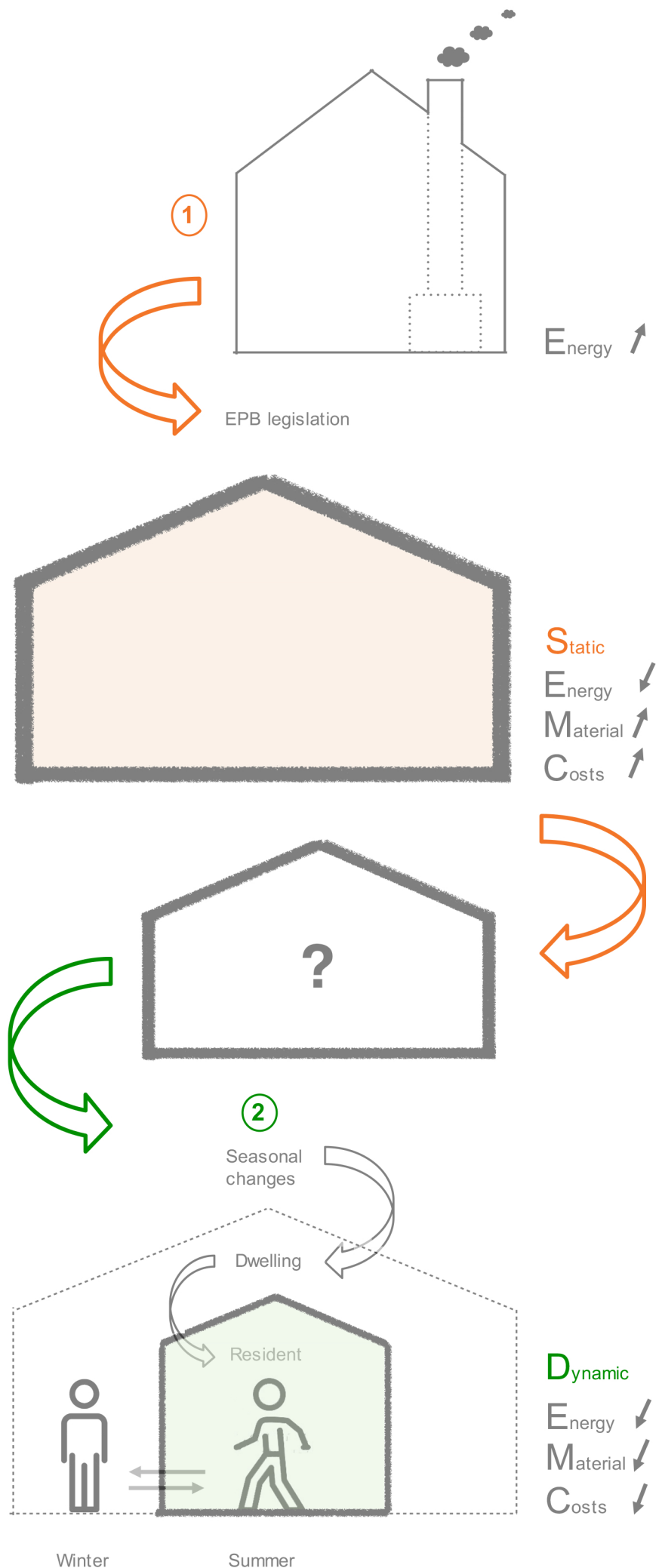
➤ **Literature study:** insights in sustainable building and renovation concepts, the Flemish housing stock, design methods to support residents (living in sustainable and dynamic dwellings) and climate-responsive strategies

➤ **Case study:** existing cases to be searched and analysed to **extract dynamic design strategies and principles** and **preconditions** under which these strategies work and to check their performance on energy, materials, costs, spatial quality

➤ **Development of dynamic concepts:** through **research by design** new building concepts are developed and then **applied** as renovation concepts in the **context of shrinkage** (underused, detached, single family dwellings).

➤ **Supported by** workshops with experts and designers, experiments with residents in living labs and the studio's and thesis' of students

➤ **Evaluation process:** a **constant interaction** with the development and implementation through **qualitative** (focus groups, interviews) and **quantitative research** (calculations methods for analysis of comfort, environmental impact, cost efficiency and flexibility).



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