Modelling of long-term deep renovation strategies for the Walloon building stock

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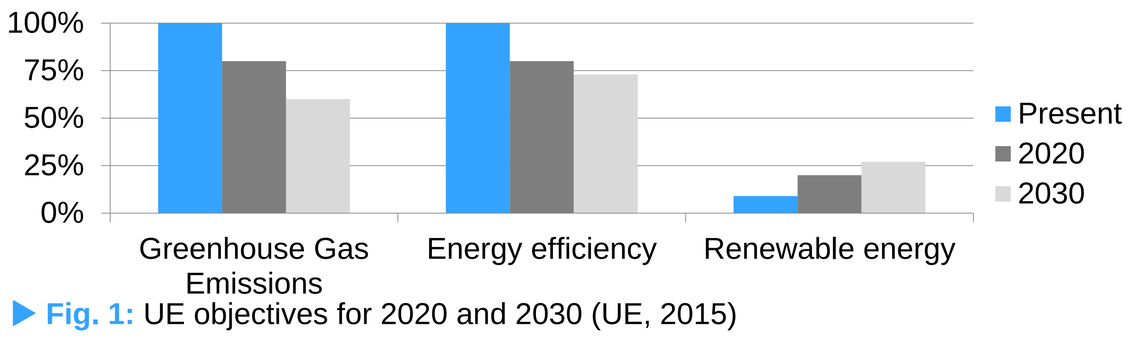
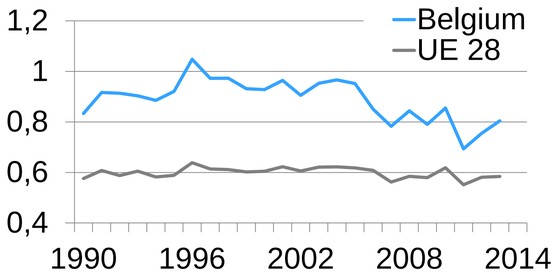
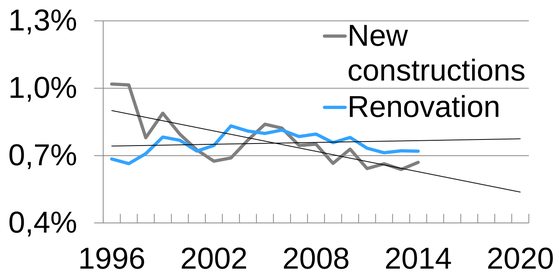
CONTEXT



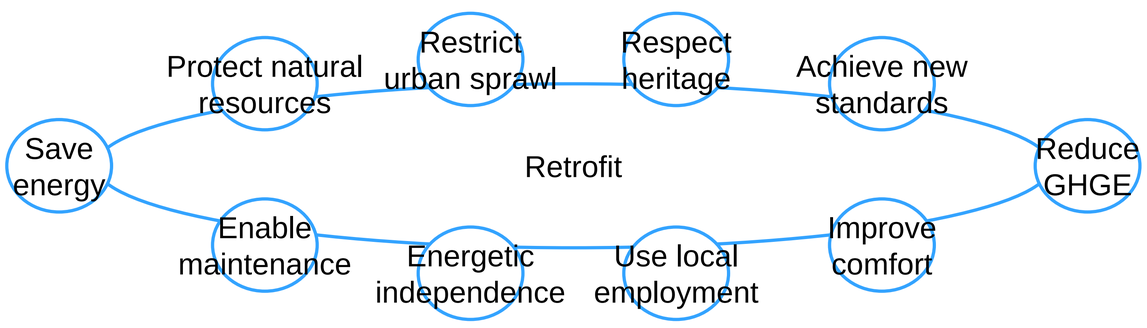
▶ **Fig. 1:** UE objectives for 2020 and 2030 (UE, 2015)



▶ **Fig. 2:** Final energy use for residential sector (TOE/per.year) (Eurostat, 2015)



▶ **Fig. 3:** Renovation and new construction rates in Belgium per year (DGSIE, 2015)

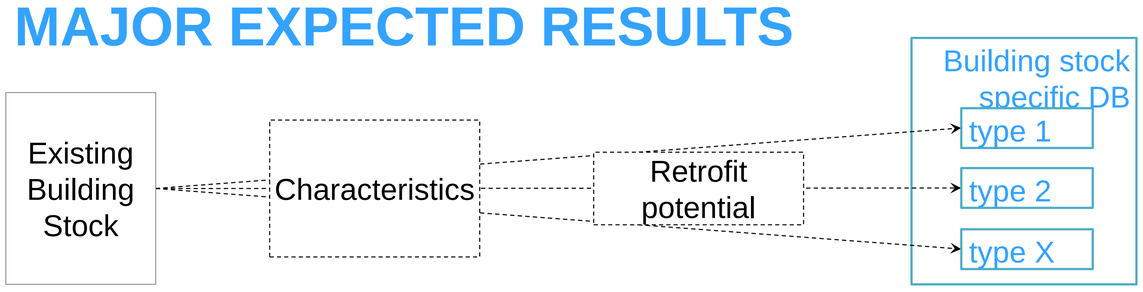


▶ **Fig. 4:** Retrofit Issues (Ruellan, 2016)

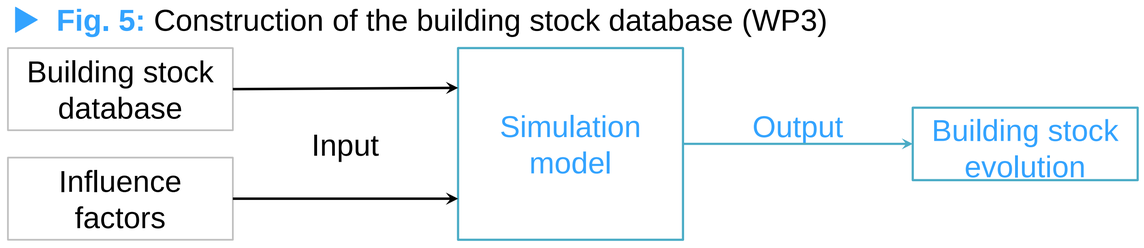
OBJECTIVE

- Specify the condition and performance of the Belgian built stock to understand the stakes of renovation.
- Identify and evaluate the factors influencing the rate of renovation that can modify the condition of the built stock.
- Create a simplified database - including energy, technical and socio-economical factors - of the Walloon built stock.
- Define the responses of the Walloon model to the influence factors previously analyzed.
- Analyze the existing strategies for the renovation of the Walloon built stock and propose improvements to improve effectiveness.

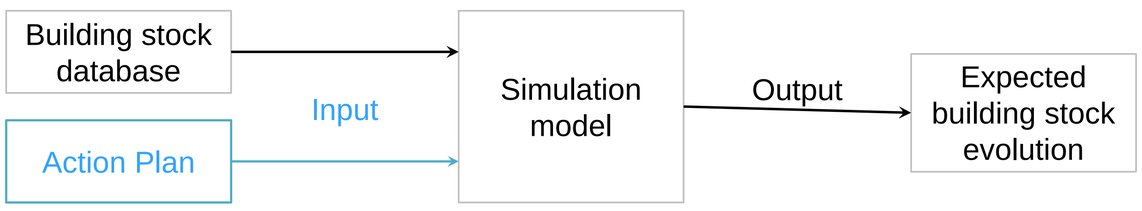
MAJOR EXPECTED RESULTS



▶ **Fig. 5:** Construction of the building stock database (WP3)



▶ **Fig. 6:** Simulation of the Influence Factor effects (WP4)



▶ **Fig. 7:** Creation and validation of an Action Plan (WP5)

KEYWORDS

Multi-criteria analysis, building energy performance, policies, action plan

METHODOLOGY

The methodology of the research project is briefly presented in the map below and is illustrated by Fig. 8.

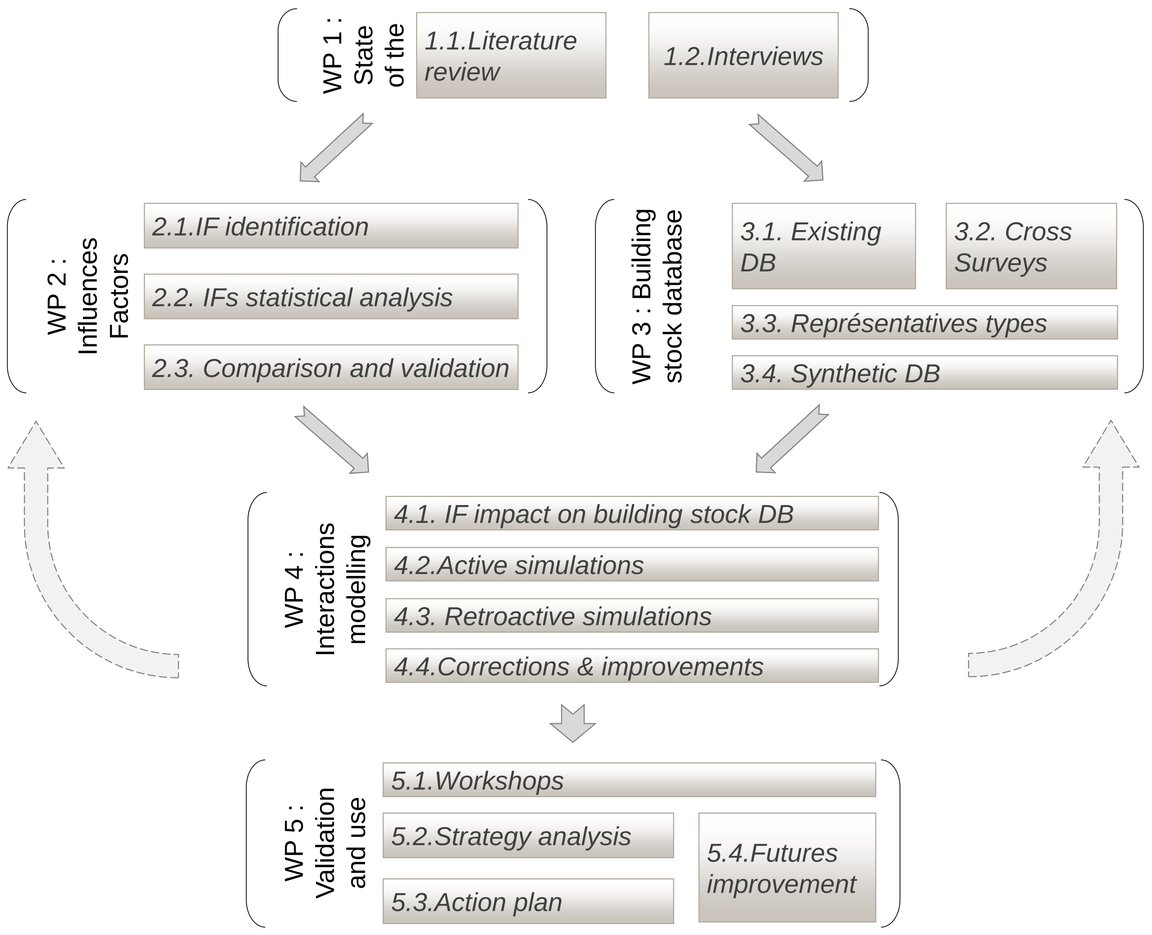
Work package 1: State of the renovation market in Belgium and Europe, through literature review and interviews

Work package 2: Statistical analysis of Influences Factors modifying the existing built stock characteristics.

Work package 3: Compilation of representative data about the Walloon building stock (Fig. 5).

Work package 4: Modelling of estimated impacts of WP2 factors on the retrofit rate of WP3 model (Fig. 6).

Work package 5: Use of the created model (Fig. 7).



▶ **Fig. 8:** Organisation chart of the research project (Ruellan, 2016)

AUDIENCE

- decision-makers;
- all stakeholders involved in a renovation project.

ORIGINALITY

There is no binding long term renovation strategy and target for renovation for the Belgian building stock. The proposed research enables the development of a multi-criteria model (economic, ecological, comfort), allowing the development of a strategy with renovation target priorities. The action plan and building stock classification developed by this research will enable the institutional policy makers and investors to bring the entire Belgian building sector up to nearly-zero standard by 2050. The research will help in the formulation and implementation of an effective long-term policy and legal framework for the achievement of the EU 3% renovation rate objective.

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