PhD student: Guirec Ruellan – SBD Lab, ULg
Supervisor: Prof. Dr. Shady Attia – SBD Lab, ULg

RESEARCH INFORMATION

KEYWORDS
Multi-criteria analysis, building energy performance, policies, action plan, systematic strategies

CONTEXT

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

- Greenhouse Gas Emissions
- Energy efficiency
- Renewable energy

Fig. 2: Final energy use for residential sector (TOE/per.)

- Belgium
- EU 28

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

- New constructions
- Renovation
- Tendencies

Fig. 4: Retrofit Issues

- Protect natural resources
- Energy independence
- Improve comfort

Fig. 5: Models for the building stock

- Existing Building Stock
- Characteristics
- Retrofit potential

Fig. 6: Simulates Influence Factor effect

- Building model
- Input
- Simulation
- Output

Fig. 7: Create and validate an Action Plan

- Building model
- Input
- Simulation
- Output

CONTACT

Sustainable Buildings Design Lab (SBD) – www.sbd.ulg.ac.be
Allée de la Découverte, 9 - Quartier Polytech 1
Sart Tilman B52/3
4000 Liège, Belgium
Tel: +32 43 66 91 55
guirec.ruellan@ulg.ac.be

OBSERVATION

- What is the state of the renovation market in Belgium?
- Who are the different stakeholders in renovation?
- What are the barriers to the increasing of retrofit rate in Belgium?
- What are the existing strategies to increase the retrofit rate?
- What are the factors influencing the retrofit rate?
- What is the most suitable strategy to increase the retrofit rate in Belgium?
- How can we increase the renovation rate in Belgium?

EXPECTED RESULTS

Fig. 8: Organisation chart of the research project

- WP 1: Investigations / State of the art
  - Literature review
  - Interviews and survey
- WP 2: Influence Factors
  - IFs identification
- WP 3: Buildings model
  - Classification of buildings
  - IFs in different cases study
  - Comparison of potential
  - Model creation
- WP 4: Simulation of the interactions
  - IFs effect comparison
- WP 5: Validation / Practical use
  - Tests and evaluations
  - Future improvements
  - Action plan

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 stock 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.

REFERENCES