<table>
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<tr>
<th>Tentative title of the master thesis</th>
<th>Opportunities in retrofitting to improve social performance of dwellings in Brussels Capital Region</th>
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<td><strong>Context of the master thesis</strong></td>
<td>In the construction sector, European regulations mainly tackle energy efficiency in buildings and renewable energy production. Within this framework, some aspects might be disregarded from the point of view of sustainable development: housing retrofit must address socio-economic impacts throughout the whole life cycle of buildings (production of building elements, operating phase, maintenance and end of life). Several tools and rating systems exist for assessing sustainability of buildings (LEED, BREEAM, Valéo, etc.). Originally developed to assess environmental impacts, these tools are increasingly including the assessment of social aspects. However, none of them seems suitable for a complete comprehensive assessment from a life cycle perspective to be applied to a specific context such as Brussels-Capital Region. Several sources propose generic socio-economic aspects to be considered in order to perform holistic assessments for ensuring more sustainable practices (CEN standards in social life cycle assessment, labels, tools, etc.) But local issues specific of the socio-economic context must be also considered, for instance, the particular heritage value of Brussels housing stock, the high fuel poverty rates, unaffordability of investment costs for retrofitting, the construction sector strongly affected by the economic recession, with high unemployment rates and deteriorated working conditions. Retrofitting has been identified as a key factor to reduce environmental impacts, but also to improve social conditions and to boost activity in the construction sector. Retrofitting practices with the best social impacts, such as those which enhance job creation, ensure affordable decent living conditions, etc. must be identified and encouraged. This work aims at: - clarifying how to assess/identify sustainable retrofitting solutions (from a holistic point of view) - identifying more sustainable solutions associated to specific cases in a particular context in order to guide decision making.</td>
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<td><strong>Objectives of the master thesis</strong></td>
<td>Bibliographic review of social aspects considered in available tools, rating systems and labels for building assessment in order to identify socio-economic aspects to be considered to assess sustainability of retrofitting works. After performing the bibliographic review, a field study is suggested, in order to collect retrofitting practices associated to some selected case study typologies in a “catalogue”. It would include:</td>
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- retrofitting works commonly used for the typologies selected,
- best-performing retrofitting practices regarding the social aspects selected (e.g., thermal comfort, indoor air quality, contribution to development),
- SWOT analyses (strengths, weaknesses, opportunities, threats) of implementing best-performing solutions (e.g., availability in the Belgian market, affordability, risk assessment, etc.) in these typologies.

**Supervisor**
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**Working language**
English/French

**Student profile**
Civil Engineering/Architectural Engineering/Any Engineering

**Prerequisites/special skills (optional)**
Special interest in renovation and sustainable architecture is recommended

¹ The supervisor must hold an academic position in VUB or ULB Faculty of Engineering
² The co-supervisor must hold an academic position